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Consultants in hydrogeology, environmental sciences and engineering, site investigation/remediation, ISRA and UST compliance

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DUPLICATE

Index Number CERCLA 02-2003-2014

CAP AND ACCESS ROADWAY REMEDIAL ACTION WORKPLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

DRAI Job No. 01C2084Q

Prepared for:

Edgewater Enterprises, L.L.C.
525 River Road
Edgewater, New Jersey 07020

Prepared by:

Dan Raviv Associates, Inc.
57 East Willow Street
Millburn, New Jersey 07041

May 16, 2003

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1.0 INTRODUCTION

Dan Raviv Associates, Inc. (DRAI) has prepared this *Remedial Action Workplan* (Workplan) on behalf of Edgewater Enterprises, LLC pursuant to the Administrative Order on Consent (Order) entered into by Edgewater Enterprises and the U.S. Environmental Protection Agency (USEPA) on March 21, 2003 (USEPA 2003). The Order provides for the construction of a cap and access roadway over an area of contamination located on an Easement that includes a portion of the former Celotex Industrial Park property (Celotex Property) and a portion of the Quanta Resources Superfund Site (Quanta Site) in Edgewater, New Jersey (Figure 1).

The Easement is defined in the Order as that portion of the Quanta Site that the County of Bergen acquired through Eminent Domain, as specified in Paragraph 3 of the Order for Judgment and for Appointment of Commissioners entered on April 13, 2000, Borough of Edgewater v. Estate of James V. Frola, Sr. *et al.*, in Superior Court of New Jersey, Bergen County, BER-L-509-00 (Figure 2). The Easement is fully described (metes and bounds) in Appendix A.

The Quanta Site is defined in the Order as including, but not limited to, real property located at 163 River Road, Edgewater, Bergen County, New Jersey (Figure 2), and designated by the following property description: Block 95, Lots 1, 2, and 3, on the Tax Map of the Borough of Edgewater, New Jersey. The Quanta Site also includes any areas where hazardous substances have migrated or threaten to migrate from the Quanta Site.

The former Celotex Property is adjacent to the Quanta Site, and is currently being developed by Edgewater Enterprises (Figure 2). The Celotex Property is defined in the Order as real property located at 225 River Road, Edgewater, Bergen County, New Jersey, and designated by the following property description: Block 91, Lot 1 on the Tax Map of the Borough of Edgewater, New Jersey. The expansion of River Road in 1995-1996 was constructed over a portion of the Quanta Site. Edgewater Enterprises is constructing a roadway on the Easement to allow for access to the former Celotex Property from River Road.

1.1 Purpose and Scope

The purpose of this Workplan is to summarize how Edgewater Enterprises, LLC will complete the applicable requirements of Paragraph 31 of the Order, which requires performance of the following tasks:

(1) Preparation of a detailed schedule for the performance of all Work set forth in the Order;
(2) Disposal Plan that addresses the proper handling and disposal of all waste generated or encountered under activities of the Order;

(3) Pre-construction and post-construction elevation maps of the Easement and the southern portion of the Celotex Property;
(4) Removal of structures, underground pipes, underground storage tanks (USTs) or other waste that may be encountered during the construction of the roadway on the Easement;
(5) Site Security Plan for the Quanta Site;
(6) Installation of a chain-link fence, including two gates, to restrict access to the Quanta Site from the Easement;
(7) Installation of a driveway in the curb at each gate to enable ingress and egress to the Quanta Site;
(8) Placement of a capping system on the Easement, as approved by the New Jersey Department of Environmental Protection (NJDEP) for the adjacent Celotex Property under the *Soil Remedial Action Workplan - High Concentration Arsenic Area* (DRAI 2002a and NJDEP 2002b);
(9) Construction of a roadway within the Easement; and
(10) Long-term maintenance of the slope, drainage and grading on the Easement.

Pursuant to Paragraphs 36 and 37 of the Order, a Sampling and Analysis (S&A) Plan, Disposal Plan, Quality Assurance/Quality Control (QA/QC) Plan, and Health and Safety Plan (HASP) have also been prepared (see Section 3.12).

1.2 Report Organization

This Workplan is organized as follows:

Section 1.0 includes general background information regarding the Easement, former Celotex Property and Quanta Site.

Section 2.0 summarizes remedial investigation activities at the former Celotex Property, including geology, hydrogeology, and the NJDEP-approved remedial action.

Section 3.0 presents the Workplan for the Easement.

Section 4.0 lists references.

2.0 FORMER CELOTEX PROPERTY

Remedial activities associated with the former Celotex Property are being conducted pursuant to an Administrative Consent Order (ACO) entered into by Edgewater Enterprises and the NJDEP in April 1999, as amended (ACO Amendment) on June 21, 2002 (NJDEP 1999 and 2002a).

The High Concentration Arsenic Area is defined in the ACO Amendment as the area within the 1,000-ppm arsenic contour line (Figure 2). The Arsenic Area is defined as the area within the 100-ppm arsenic contour line. Edgewater Enterprises is constructing a cap over the High Concentration Arsenic Area in accordance with the July 29, 2002 *Soil Remedial Action Workplan – High Concentration Arsenic Area* (Soil RAW) (DRAI 2002a), which was approved by the NJDEP on September 27, 2002 (NJDEP 2002b).

2.1 Geology and Hydrogeology

The following description of the geology and hydrogeology of the Arsenic Area on the former Celotex Property is from the NJDEP-approved July 29, 2002 Soil RAW (DRAI 2002a and NJDEP 2002b).

The Arsenic Area is underlain by 8 to 15 feet of fill, which overlies 3 to 20 feet of native materials. The fill material has been described as two distinct layers, the upper fill and lower fill. On the former Celotex Property, the thickness of the upper fill material varies between 5 and 7 feet. The upper fill material is comprised of a dark brown sand and silt with rocks, and construction and demolition debris (wood, bricks, and concrete). This material was placed around 1988 to raise the elevation of the former Celotex Property, and is not related to former site operations. This upper fill material does not extend onto the adjacent Quanta Site and Easement.

The lower fill material varies in thickness from 3 to 10 feet, and was found to contain a reddish purple sand; gray clay with cobbles, brick and cement; black sand and silt with cobbles and gravel; wood and concrete. This layer is believed to have been deposited during construction in the late 1800s and/or early 1900s. This lower fill material extends onto the adjacent Quanta Site and Easement, as opposed to the upper fill material, which is limited to the former Celotex Property.

Native soils are found beneath the lower fill material. Within the Arsenic Area, the top layer of the native material is meadow mat; under the meadow mat there is a sand layer, then a silt layer which rests on bedrock. Native soils range in thickness from approximately 3 feet in the eastern portion of the High Concentration Arsenic Area to approximately 20 feet in the western portion on the High Concentration Arsenic Area. The primary water-bearing unit within the native material is the sand layer, which in the High Concentration Arsenic Area is separated from the overlying fill by the meadow mat layer.

Bedrock occurs from 14 to 35 feet below ground surface (bgs) in and around the High Concentration Arsenic Area. The top of the bedrock rises from the western to the eastern portion of the High Concentration Arsenic Area, and descends from the eastern edge of the High

Concentration Arsenic Area eastward toward the Hudson River. Geotechnical borings drilled by Melick Tully in 1999 indicated bedrock at depths of 77 to 129 feet bgs near the river.

Ground water occurs under the former Celotex Property at depths ranging from 8 to 18 feet bgs. In general, ground water flows to the east and northeast. There is a slight upward component to ground water flow from the bedrock to the overburden.

The water table in the High Concentration Arsenic Area occurs approximately 9 feet bgs, and exists within the historic fill material that was brought in to raise the site grade for development beginning in the nineteenth century. Specifically, the water table occurs within the lower fill unit, and there is a limited saturated thickness (2 to 4 feet) within this lower fill unit (from the water table down to the top of the meadow mat).

2.2 Remedial Action – High Concentration Arsenic Area

The NJDEP-approved remedial action for soils in the High Concentration Arsenic Area on the former Celotex Property is to implement institutional (deed notice) and engineering controls (installation and maintenance of a cap). The cap was designed according to NJDEP's *Technical Requirements for Site Remediation* (TRSR) at N.J.A.C. 7:26E, and NJDEP's November 1998 *Guidance Document for the Remediation of Contaminated Soils*, Chapter 4 Remedial Action – Containment and Exposure Controls (NJDEP 1998). Refer to Figure 3 for a plan view showing the extent of the cap and for typical cross-sections showing the layers of the NJDEP-approved cap for the High Concentration Arsenic Area.

3.0 WORKPLAN FOR CONSTRUCTION OF CAP AND ACCESS ROAD

In accordance with the March 14, 2003 *Environmental Assessment Site Reconnaissance Scope of Work – Celotex Industrial Park, Quanta Resources Superfund Site* (DRAI 2003a), DRAI and Clean Harbors performed a site inspection of the Easement on April 17, 2003. The purpose of the site inspection was to identify all buildings and trailers present on the Easement and surrounding area, and to inventory any materials and wastes identified on the Easement, including interior and exterior areas, that will require removal and disposal. For the purposes of the site inspection, wastes were defined in accordance with the Order as (1) any "hazardous substance" under Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601(14); (2) any "pollutant or contaminant" under Section 101(33) of CERCLA, 42 U.S.C. 9601(33); (3) any "solid waste" under Section 1004(27) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6903(27); and (4) any mixture containing any of the constituents noted in (1), (2), or (3), above.

The findings of the site inspection have been summarized in an Environmental Assessment report (DRAI 2003b), which is being concurrently submitted to USEPA with this Workplan. The Environmental Assessment report was used to prepare this Workplan, to support waste classification decisions, and to estimate waste quantities to be removed and disposed.

The following sections constitute the Workplan for construction of the cap and access roadway on the Easement, and follow the Outline of Paragraph 31 of the Order (Tasks 1 through 10). Work will be performed in such a manner as to minimize the impact to the local environment. Additionally, all activities will be conducted in accordance with USEPA procedures and U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations.

3.1 Schedule

A project schedule is included as Figure 4. This schedule is an update to the schedule that was previously submitted to the USEPA during the April 17, 2003 site inspection. The schedule has been updated to reflect the extension granted by the USEPA (to May 16, 2003) for submittal of this Workplan.

3.2 Disposal Plan

Structures, debris and other waste materials were identified within the Easement during the site inspection (Figure 6). The *Environmental Assessment Site Reconnaissance Report* (DRAI, 2003b), being submitted to the USEPA with this Workplan, includes a complete description of the structures, debris and wastes that were identified within (or partially within) the Easement during the site inspection.

The *Hazardous Substances Disposal Plan* (Appendix B) includes procedures for the handling and disposal of all hazardous substances generated or encountered during work on the Easement. Pursuant to Paragraph 35 of the Order, all hazardous materials leaving the Quanta Site will be transported in accordance with federal and state requirements. Records (i.e., manifests, bills of

lading, invoices, and gate receipts) of removed materials will be maintained, and will include the quantity of wastes that are removed and the destination of the wastes.

The *Demolition and Non-Hazardous Materials Disposal Plan* (see Section 3.4 and Appendix C) includes procedures for demolition of the three building structures located on the Easement, and for handling and disposal of demolition debris and other non-hazardous materials generated or encountered during work on the Easement.

3.3 Pre-Construction and As-Built Drawings

A pre-construction (existing conditions) elevation map of the Easement was prepared by the engineer-of-record for the roadway design (McNally Engineering, LLC, Oakland, New Jersey), and is included as Figure 5.

In accordance with the Order, a cap and access roadway will be constructed on the Easement. See Section 3.8 for a discussion of the design of the cap, and section 3.9 for a discussion of the access roadway.

Post-construction elevation (survey) maps (i.e., as-built drawings) will be prepared when construction of the cap and access roadway is complete. As-built drawings will be prepared by the engineer-of-record; for the cap, DRAI, and for the roadway, McNally Engineering. Pursuant to Paragraph 31 (Task 3) of the Order, as-built drawings will be submitted to the USEPA within five (5) days of preparation.

3.4 Removal of Structures, Underground Pipes, and USTs

Structures, debris and other waste materials were identified within the Easement during the site inspection (Figure 6). The *Environmental Assessment Site Reconnaissance Report* (DRAI 2003b), being submitted to the USEPA with this Workplan, includes a complete description of the structures, debris and wastes that were identified within (or partially within) the Easement during the site inspection.

The *Demolition and Non-Hazardous Materials Disposal Plan* (see Appendix C) includes procedures for demolition of the three building structures located on the Easement, and for handling and disposal of demolition debris and other non-hazardous materials generated or encountered during work on the Easement. The concrete foundation of the buildings will be left in place in accordance with Paragraph 31 (Task 4) of the Order. Any hazardous substances will be handled in accordance with the *Hazardous Substances Disposal Plan* (see Section 3.2 and Appendix B).

Prior to demolition of the blue corrugated metal building, the USEPA site identification sign will be removed and reposted on the Quanta Site along River Road at the location and height specified by the USEPA's On-Scene Coordinator (OSC).

In addition to the above ground structures identified during the site inspection, underground pipes and USTs may be located within the Easement. A geophysical investigation will be

conducted to identify underground features following demolition of the buildings and removal of debris. A Workplan for conducting the geophysical investigation and documenting the results is included as Appendix D.

Any underground pipes or USTs that are encountered during the construction of the cap and access roadway on the Easement will be removed as discussed in Appendix D.

3.5 Site Security During Construction

The following is a discussion of the security measures that will be taken to keep unauthorized personnel from entering restricted work areas during construction of the cap and access roadway on the Easement, and to prevent vehicular access to unauthorized areas of the Quanta Site. For the purposes of this Workplan, the restricted work area (work area) on the Quanta Site follows the same boundary as the Inspection Area (Figure 2). Also for purposes of this Workplan, unauthorized areas of the Quanta Site are defined as the portions of the Quanta Site that are not included in the work area.

The perimeter of the former Celotex Property is currently secured with a chain-link fence, and access is controlled through gates located along the property boundary. The perimeter of the Quanta Site is also secured with a chain-link fence. In the vicinity of the Easement, access to the Quanta Site is controlled through gates, one located along River Road and another along the former Celotex Property line. There is a second chain-link fence located within the Easement along the property boundary between the former Celotex Property and the Quanta Site (Figure 2).

Any gates and fencing located within the work area will be removed to allow for construction activities. The perimeter of the work area will be secured during construction by installing a temporary chain-link fence wherever an existing chain-link fence does not exist. The work area perimeter fencing will restrict unauthorized personnel and vehicles from entering the work area until the completion of the work, and limit access to unauthorized areas of the Quanta Site. Temporary gates will be installed along the work area perimeter fencing to allow vehicular and personnel access to the work area during construction of the cap and access roadway. The exact location of these gates will be determined in the field.

A minimum of two signs will be posted along the work area perimeter fencing. These signs will be marked "Authorized Personnel Only" and "No Trespassing." As discussed in Section 3.4, the USEPA site identification sign will be removed from the blue metal building and reposted on the Quanta Site along River Road at the location and height specified by the USEPA's OSC.

During work hours, unauthorized vehicular and personnel access will be limited by the Health and Safety Officer (see Section 3.12 for a discussion of the Health and Safety Plan). During non-working hours, the gates will be locked.

Installation of permanent fencing and driveways is discussed in Sections 3.6 and 3.7, below.

3.6 Fencing

The perimeter of the Quanta Site is currently secured with a chain-link fence. In the vicinity of the Easement, access to the Quanta Site is currently controlled through gates, one located along River Road and another along the former Celotex Property line (Figure 2). These two gates, as well as portions of the Quanta perimeter fencing, will be removed during construction of the cap and access roadway on the Easement (see Section 3.5).

Pursuant to Paragraph 31 (Task 6) of the Order, a chain-link fence and two gates will be installed on the Quanta Site at the conclusion of work to replace the existing fence and gate that will be removed during construction on the Easement. The gates will be installed at locations agreed to by the USEPA's OSC. Proposed locations for the two gates are shown on Figure 7. Additionally, a chain-link fence will be installed along the boundary between the Easement and the Quanta Site to restrict access to the Quanta Site (Figure 7).

Installation of driveways at the gate locations is discussed in Section 3.7.

3.7 Driveways

Two gates will be installed on the Quanta Site to replace the existing fence and gates that will be removed during construction on the Easement (see Section 3.6). The gates will be installed at locations agreed to by the USEPA's OSC. Proposed locations for the two gates (and associated driveways) are shown on Figure 7. Pursuant to Paragraph 31 (Task 7) of the Order, a driveway will be installed in the curb at each gate to enable ingress and egress to the Quanta Site.

3.8 Cap Design

A cap will be placed over the ground in the Easement following the removal of structures, underground pipes, USTs or other wastes (see Sections 3.2 and 3.4). Pursuant to Paragraph 32 of the Order, soils will not be excavated, and conduits, piping and storm water drains will not be placed below existing grade level in the Easement. The only exception is the anchor trench for the liner. In order to meet existing grades, an anchor trench will be excavated along the edge of the liner, approximately 1 foot below grade (Figure 8). All soils excavated during construction of the anchor trench will be placed beneath the liner on the Easement.

The cap on the Easement (Easement cap) will be a continuation of, and the design will be consistent with, the cap that was approved by the NJDEP (Figure 3) under the *Soil Remedial Action Workplan – High Concentration Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey* (DRAI 2002a, 2002b, and 2002c; and NJDEP 2002b and 2002c). The Celotex cap was designed according to the NJDEP's *Technical Requirements for Site Remediation* (TRSR) at N.J.A.C. 7:26E, and NJDEP's November 1998 *Guidance Document for the Remediation of Contaminated Soils*, Chapter 4 Remedial Action – Containment and Exposure Controls (NJDEP 1998).

The Easement cap includes the placement of the layers listed below (listed from top to bottom of cap):

- Primary Impermeable Barrier Layer (where applicable)
  - Either asphalt pavement or concrete (see Figure 7 for layout of roadway and surface course)

- Reused Material (from former Celotex Property)
  - Soil backfill required to construct Roadway to proposed grades
  - Thickness on Easement will vary from approximately 1 to 13 feet

    - Utilities
      + As approved by NJDEP for the former Celotex property, any utilities on the Easement (e.g., storm sewer) will be placed within the Reused Material layer
      + Utilities will be placed on a 6-inch minimum bedding of ¾ inch clean, crushed stone

    - Sand Material (certified clean or approved equal)
      + Added as a field modification at former Celotex Property, and will also be used on Easement
      + Protects geotextile layer from construction and demolition (C&D) debris in the reused material
      + Thickness varies from 12 to 24 inches

- Protective Layer
  - 4-ounce non-woven, permeable geotextile

- Secondary Impermeable Barrier Layer (Liner)
  - Geomembrane liner, 30-mil polyvinyl chloride (PVC)

- Protective Layer
  - 4-ounce non-woven, permeable geotextile
  - Note - 6-inch minimum of QP stone or stone dust (compacted) added as a field modification at the Former Celotex Property will also be used on the Easement to protect the geotextile from any protrusions in the upper fill (reused) material.

- Reused Material (from former Celotex Property)
  - Note – Additional fill is required on the Easement to construct the Liner to proposed grades
  - Thickness on Easement will vary from approximately 0.5 to 4 feet

All materials used in the construction of the cap will comply with applicable federal and state regulations. The design engineer will inspect key aspects of cap installation to ensure it is constructed in accordance with the design.

Refer to Figure 8 for the plan view (aerial extent) of and grading plan for the cap in the Easement. Refer to Figure 9 for a cross-section of the Easement cap, showing the continuation and grading of the Easement cap along the former Celotex Property and the Easement.

3.9 Roadway Construction

Edgewater Enterprises will construct an access roadway within the Easement. McNally Engineering, LLC is the engineer-of-record for the access roadway. Refer to Figure 7 for a plan showing the current design of the access roadway, including alignment, drainage, grading, pavement, fencing and guardrail location.

3.10 Maintenance and Reporting

Edgewater Enterprises is responsible for the long-term maintenance of the slope, drainage and grading on the Easement. No new installation activities are planned within the Easement. A plan and schedule for maintenance activities is outlined below. All maintenance activities will be recorded and reported to the USEPA according to the plan outlined below.

The NJDEP approved a post-capping maintenance and monitoring program at the former Celotex Property as part of the Soil RAW for the High Concentration Arsenic Area (DRAI 2002a and NJDEP 2002b). The maintenance and monitoring program will be included in the Deed Notice, which will be recorded by Edgewater Enterprises in accordance with the Soil RAW. As the Easement cap will be a continuation of (and the design consistent with) the Celotex cap, the NJDEP-approved post-capping maintenance and monitoring program is proposed for use on the Easement, as outlined below.

Inspection and maintenance procedures for the Easement will be the same as for the Celotex cap; that is, in accordance with the "*Technical Requirements for Site Remediation,*" N.J.A.C. 7:26E-6.4 (Post-Remedial Action Requirements). At a minimum, the procedures for the operation and maintenance (O&M) of the cap following installation will be as follows:

- Cap inspection on a regular basis for signs of disrepair and damage, and subsequently repaired as necessary;
- If any breaches are found that may compromise the integrity of the cap, repairs will be made;
- Site inspection on a regular basis to ensure land use is in accordance with the deed notice;

Monitoring Report(s) will be submitted to the USEPA (and the NJDEP) every two (2) years certifying that the cap is being properly maintained according to the procedures outlined above, and continues to be protective of public health, safety and the environment.

3.11 Consistency with Long-Term USEPA Remedy

Edgewater Enterprises understands that the USEPA considers the access roadway and other improvements on the Easement (and southern portion of the Celotex Property) to be temporary, pending the selection of a permanent remedy for the Quanta Site. In accordance with Paragraph 31, Task 11 of the Order, should the USEPA select an invasive remedial action for the Quanta Site that is not consistent with the cap and access roadway described herein, Edgewater Enterprises will submit a plan for modification or removal of the roadway and other surface improvements on the Easement and portions of the Celotex Property, consistent with the USEPA selected remedy.

3.12 Required Permits, Approvals, and Plans

Appropriate permits, approvals and plans for construction of the cap and access roadway on the Easement are being submitted, as follows:

- Sampling and Analysis (S&A) Plan – A S&A Plan has been prepared pursuant to Paragraphs 36 and 37 of the Order (Appendix E). The S&A Plan describes the procedures and methods that will be implemented during sampling activities, and includes a detailed map depicting all sample locations, depths and designations, and the number and types of samples to be collected and the analyses to be performed.

- Quality Assurance / Quality Control (QA/QC) Plan – A QA/QC Plan has been prepared pursuant to Paragraphs 36 and 37 of the Order (Appendix F). The QA/QC Plan provides all quality assurance and quality control procedures to be utilized by samplers in the field and by laboratories performing analyses, and includes a description of chain of custody and data validation procedures to be followed. The QA/QC Plan also identifies the laboratory to be used; a copy of the laboratory's Quality Assurance Program Plan will be submitted to USEPA under separate cover.

- Health and Safety (H&S) Plan – H&S Plans have been prepared pursuant to Paragraphs 36 and 37 of the Order. For the purposes of preparing appropriate H&S Plans, the work activities associated with the Order were organized into three phases: (1) site inspection, waste sampling and analysis, and hazardous waste handling and removal; (2) building demolition; and (3) cap installation. A separate H&S Plan was prepared for each phase.

  (1) Site inspection, waste sampling and analysis, and hazardous waste handling and removal – A H&S Plan was prepared by Clean Harbors and submitted to the USEPA on April 3, 2003 (Clean Harbors, 2003). This H&S Plan covered performance of the site inspection, and performance of subsequent phases of work by Clean Harbors including: waste sampling and analysis, and hazardous waste handling and removal.

  (2) Building demolition – A H&S Plan is included for performance of the building demolition phase of work (Appendix G). This H&S Plan is proposed for use by the

demolition contractor, M&M Consulting and Contracting, Inc., Jersey City, New Jersey, and any subcontractors during the building demolition phase of work.

(3) Cap installation – A H&S Plan has been prepared by Environmental Waste Management Associates (EWMA), and adopted by DRAI, for performance of remedial activities at the former Celotex Property (EWMA, 2001). This H&S Plan has governed the installation of the cap on the former Celotex Property. This H&S Plan was submitted to the USEPA during the site inspection on April 17, 2003, and is proposed for use by all contractors and subcontractors during the cap installation phase of work.

- Disposal Plans – Two disposal plans have been prepared pursuant to Paragraphs 31 (Tasks 2 and 4) and 36 of the Order. Refer to Section 3.2 and Appendix B for the *Hazardous Substances Disposal Plan*, and Section 3.4 and Appendix C for the *Demolition and Non-Hazardous Materials Disposal Plan*.

- Soil Erosion and Sediment Control Plan –A Soil Erosion and Sediment Control (SESC) Plan Certification for Land Disturbance Control has been submitted to, and approved by, the Bergen County Soil Conservation District as part of the proposed redevelopment of the former Celotex Property. Edgewater Enterprises will modify the SESC Plan for the activities described in this Workplan as conditions warrant.

- Soil Reuse Plan – In accordance with the NJDEP September 27, 2002 approval letter for the former Celotex Property Soil RAW (High Concentration Arsenic Area), sampling of the soil stockpile(s) expected to be reused on the former Celotex Property is not necessary. The same soil stockpile(s) (i.e., reused material from site) will be used to construct to proposed grades on the Easement; therefore, a Soil Reuse Plan is not applicable.

- Local Approvals – Approvals from the Borough of Edgewater Planning Board and the Engineering, Zoning, Health, and Building Departments will be obtained as needed.

- UST Closure Approval – A geophysical investigation will be conducted to identify underground features following demolition of the buildings and removal of debris (see Section 3.4 and Appendix D). If USTs are identified by the geophysical investigation and/or encountered during the construction of the cap and access roadway on the Easement, they will be removed in accordance with N.J.S.A. 58:10A-21 *et seq.*, and disposed of as outlined in the Hazardous Substances Disposal Plan (see Section 3.2 and Appendix B). Post-excavation soil sampling will be for the full Target Compound List and Target Analyte List (TCL/TAL), and in accordance with the NJDEP TRSR (N.J.A.C. 7:26E) for removal of USTs and/or underground piping.

3.13 Contractors and Subcontractors

DRAI has been retained by Edgewater Enterprises to provide oversight of the implementation of the Order. DRAI, including the Project Coordinator, has been approved by the USEPA for this effort. Edgewater Enterprises has identified other contractors and subcontractors who will perform work under the Order. These include:

- Site Inspection, Waste Sampling and Analysis, and Hazardous Waste Handling and Removal: Clean Harbors Environmental Services, Inc., Newark, New Jersey
- Building Demolition: M&M Consulting and Contracting, Inc., Jersey City, New Jersey
- Geophysical Investigation: Advanced Geological Services AGS, Malvern, Pennsylvania
- UST Removal (if required): ROC Contractors, Inc., Maywood, New Jersey
- Roadway Design Engineer: McNally Engineering, LLC, Oakland, New Jersey
- Edgewater Enterprises' General Contractor: March Associates, Inc., Wayne, New Jersey
- General Contractor (for Construction of Cap and Access Roadway): ROC Contractors, Inc., Maywood, New Jersey
- Installation of Liner: The Liner Company, Inc., Colts Neck, New Jersey
- Non-hazardous Materials Hauler: Nacirema Environmental Services Company, Inc., Bayonne, New Jersey
- Non-hazardous Materials Disposal Facility: Hackensack Meadowlands Development Corporation (HMDC) Landfill, Kearney, New Jersey
- Metal Scrapyard: Meadow Management, Inc., Newark, New Jersey
- Health and Safety Officer and Environmental Consultant: Environmental Waste Management Associates, Inc. (EWMA), Parsippany, New Jersey
- Asphalt Contractor: Tilcon, Prospect Park, New Jersey

Pursuant to the Order (Paragraph 26), Edgewater Enterprises will notify the USEPA of any additional contractors or subcontractors proposed to perform work under the Order at least ten (10) days prior to commencement of their work.

4.0 REFERENCES CITED

Bergen County Clerk (2000) *Order for Judgment and for Appointment of Commissioners entered on April 13, 2000*, Borough of Edgewater v. Estate of James V. Frola, Sr. et al., in Superior Court of New Jersey, Bergen County, BER-L-509-00, Paragraph 3.

Clean Harbors (2003) *Health and Safety Plan*, Quanta Easement, Edgewater, NJ. Date.

DRAI (2002a) *Soil Remedial Action Workplan (RAW) – High Concentration Arsenic Area*, Former Celotex Industrial Park, Edgewater, NJ. July 29.

DRAI (2002b) *Response to NJDEP Comments – High Concentration Arsenic Area,* Former Celotex Industrial Park, Edgewater, NJ. October 7.

DRAI (2002c) e-mail to Robert Hayton, New Jersey Department of Environmental Protection (NJDEP) re: Former Celotex RAW – High Concentration Arsenic Area. October 28

DRAI (2002e) Letter to Robert Hayton, NJDEP re: Updated figures of soil results. May 9.

DRAI (2003a) *Environmental Assessment Site Reconnaissance Scope of Work – Celotex Industrial Park Easement,* Quanta Resources Superfund Site, Edgewater, NJ. March 14.

DRAI (2003b) *Environmental Assessment Site Reconnaissance Report – Celotex Industrial Park Easement,* Quanta Resources Superfund Site, Edgewater, NJ. May 16-.

USEPA (2003) Administrative Order on Consent. March 21.

EWMA (2001) *Site Specific Health and Safety Plan (Revision 2.0) for Construction Activities.* The Promenade - Former Celotex Industrial Park. June 18.

NJDEP. *Technical Requirements for Site Remediation* at N.J.A.C. 7:26E

NJDEP (1998) *Guidance Document for the Remediation of Contaminated Soils*. November.

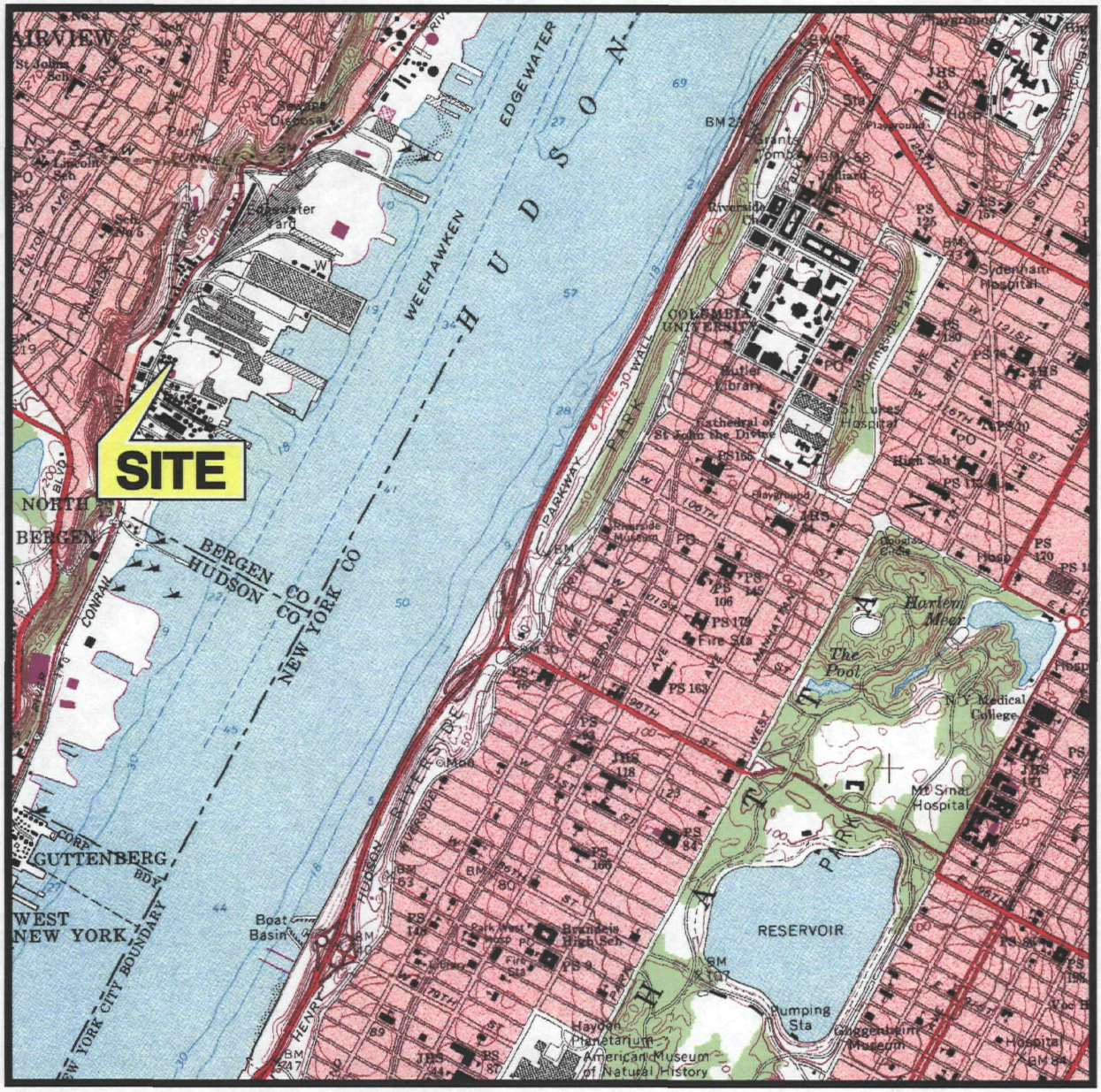
NJDEP (1999) Administrative Consent Order. April 6.

NJDEP (2002a) Administrative Consent Order (ACO) Amendment. June 21.

NJDEP (2002b) Soil RAW – High Concentration Arsenic Area, Former Celotex Industrial Park Approval Letter. September 27.

NJDEP (2002c) e-mail to Linda Caramichael, Dan Raviv Associates, Inc. (DRAI) re: Former Celotex Soil RAW – High Concentration Arsenic Area. October 29.

FIGURES



CENTRAL PARK QUADRANGLE, N.Y.–N.J.
1966
PHOTOREVISED 1979
7.5 MINUTE SERIES (Topographic)

0 2000 FT.
APPROXIMATE SCALE

N

QUADRANGLE LOCATION

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

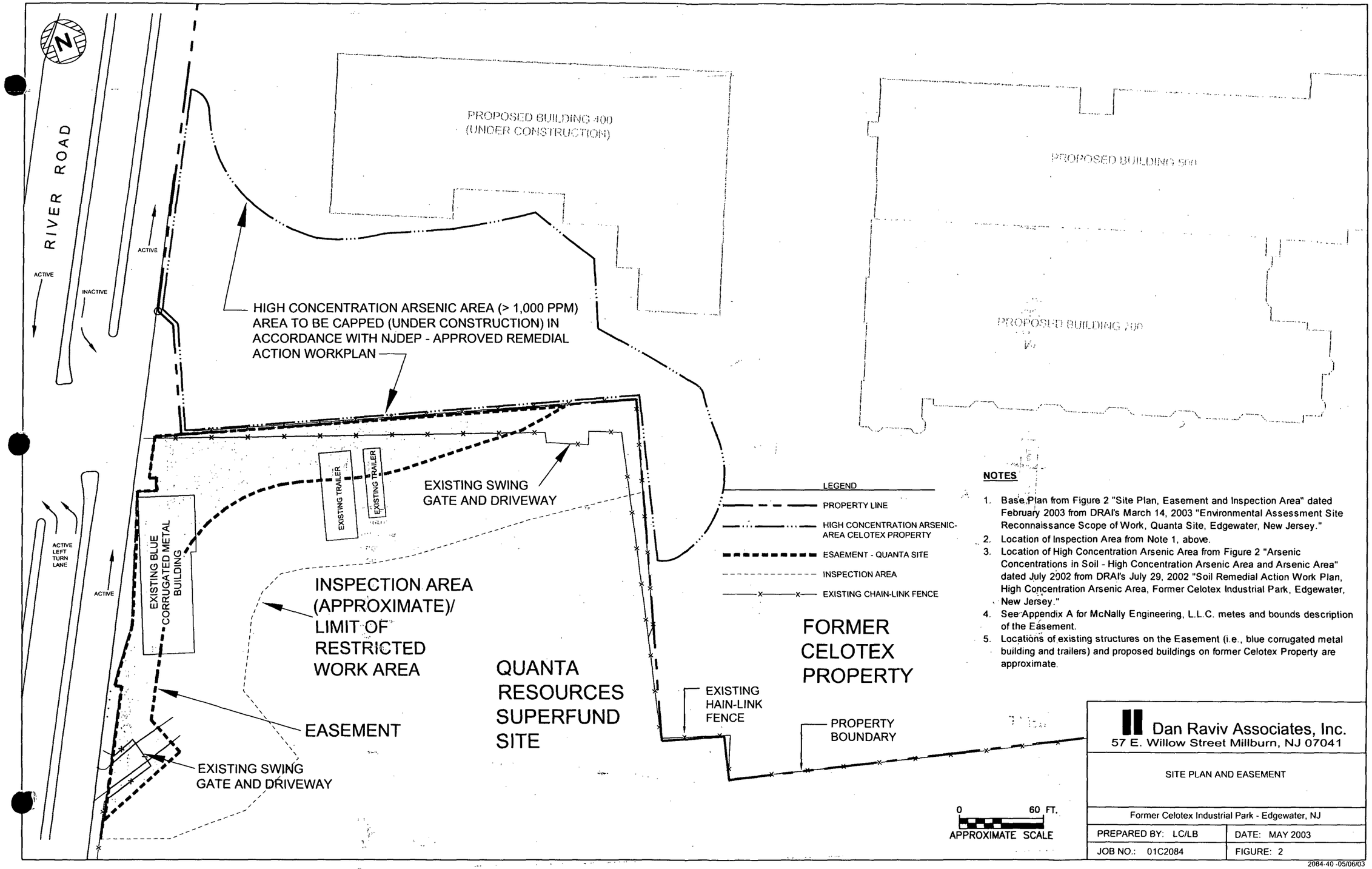
SITE LOCATION

Former Celotex Industrial Park – Edgewater, NJ

PREPARED BY: RKH/ODL	DATE: MAY 2003
JOB NO.: 01C2084	FIGURE: 1

2084SLM –05/05/02

304558



NOTES

1. Base Plan from Figure 2 "Site Plan, Easement and Inspection Area" dated February 2003 from DRAI's March 14, 2003 "Environmental Assessment Site Reconnaissance Scope of Work, Quanta Site, Edgewater, New Jersey."
2. Location of Inspection Area from Note 1, above.
3. Location of High Concentration Arsenic Area from Figure 2 "Arsenic Concentrations in Soil - High Concentration Arsenic Area and Arsenic Area" dated July 2002 from DRAI's July 29, 2002 "Soil Remedial Action Work Plan, High Concentration Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey."
4. See Appendix A for McNally Engineering, L.L.C. metes and bounds description of the Easement.
5. Locations of existing structures on the Easement (i.e., blue corrugated metal building and trailers) and proposed buildings on former Celotex Property are approximate.

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

SITE PLAN AND EASEMENT

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: LC/LB	DATE: MAY 2003
JOB NO.: 01C2084	FIGURE: 2

2084-40 -05/06/03

304559

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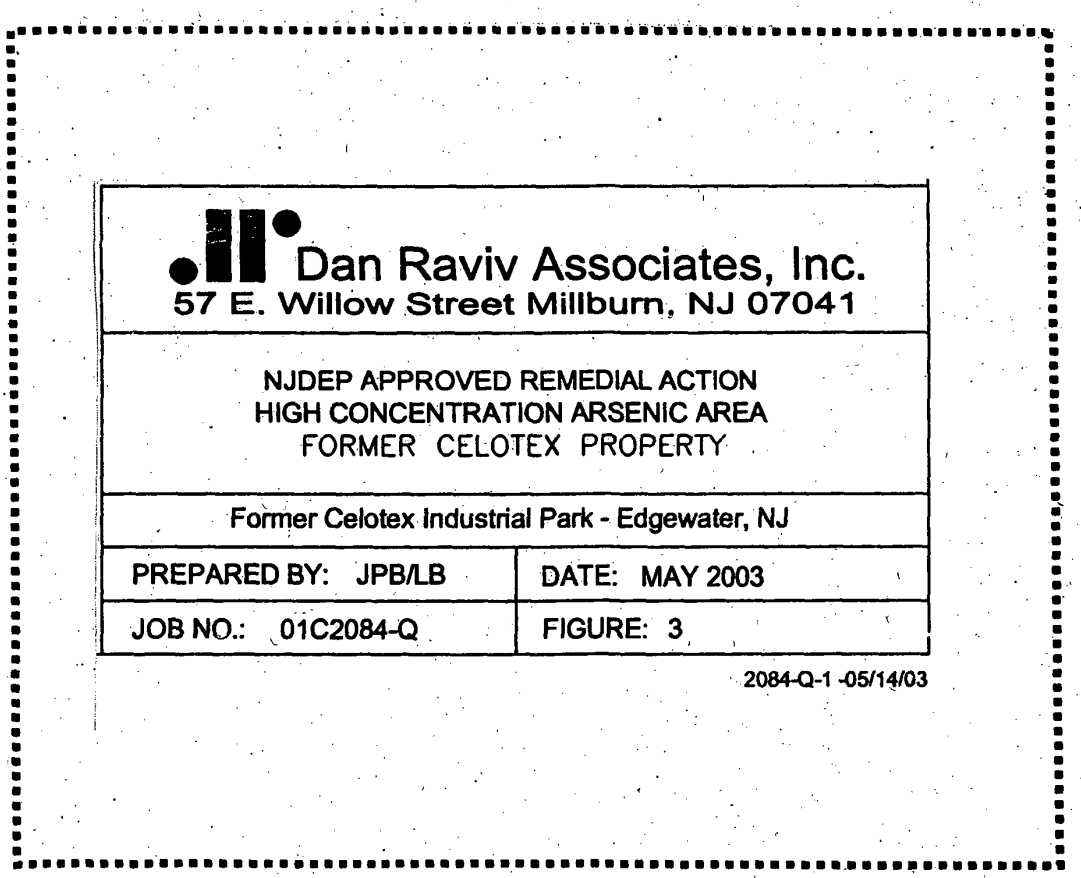

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

NJDEP APPROVED REMEDIAL ACTION
HIGH CONCENTRATION ARSENIC AREA
FORMER CELOTEX PROPERTY

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: JPB/LB	DATE: MAY 2003
JOB NO.: 01C2084-Q	FIGURE: 3

2084-Q-1 -05/14/03

304560

SCHEDULE OF EVENTS

QUANTA SUPERFUND SITE

EDGEWATER, NEW JERSEY

Task Description	April				May				June				July				August				September			
	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
Task 1 - Preparation of Workplan - Write Workplan for the Site - Write HASP, and QAPP for Quanta Site - Submit Workplan, HASP, and QAPP to EPA for Review																								
Task 2 - Site Inspection - Onsite for Inspection - Prepare Site Inspection Report - Submit Site Inspection Report to EPA																								
Task 3 - EPA Review of Workplan and Site Inspection - Review Period for Workplan, HASP, and QAPP - EPA Comments and DRAI Reponse to Comments - EPA Approval																								
Task 4 - Pre-Development of Roadway - Clear Debris Around Buildings - Removal and disposal of wastes and materials identified in Site Inspection - Demolition of Structures - Disposal of Demolition Debris - GPR Survey - Pipe and UST Removal (if found) - Sampling (if necessary)																								
Task 5 - Development of Roadway - Grading and Preparation of Liner Subgrade - Liner Installation - Placement of Cover Material - Construct Access Roadway (Final Grading, Paving, etc.)																								
Task 6 - Prepare Closure Report for the Cap - Prepare Closure Plan (Celotex and Quanta) - Submit Closure Plan to NJDEP and EPA																								

Figure 4

304561

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FIGURE TITLE

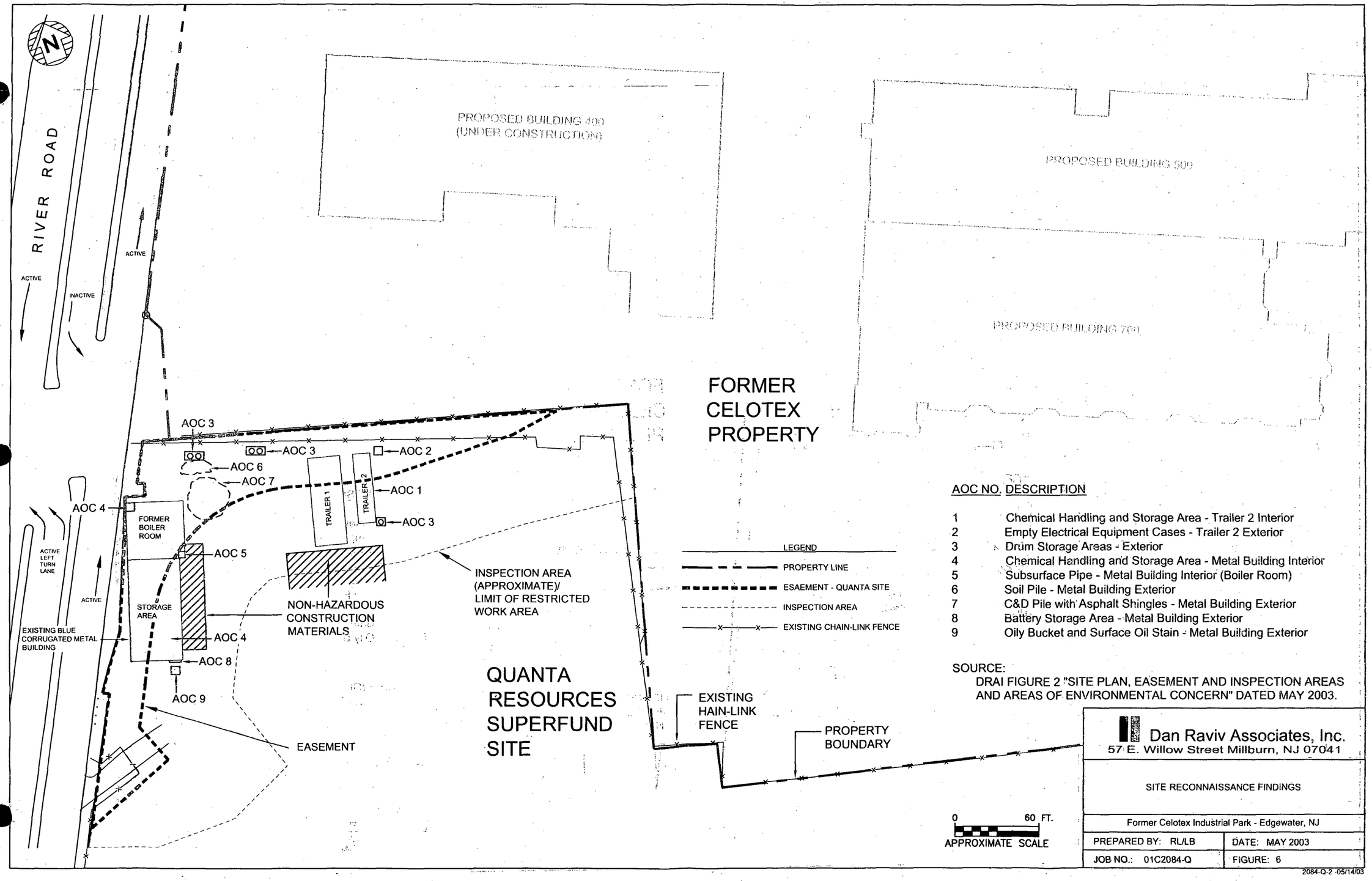
EXISTING CONDITIONS EXHIBIT

THE PROMENADE

BLOCK 91 - LOT 1
225 RIVER ROAD
EDGEWATER, NJ 07020

McNALLY ENGINEERING, L.L.C.
(CERTIFICATE OF AUTHORIZATION 24GA27928700, Exp. 06/30/04)
393 RAMAPO VALLEY ROAD
SUITE 1
OAKLAND, NJ 07436
(201) 337-9051

SCALE	DATE :	SHEET No.:	FIGURE No.:
1" = 20'	05/07/03	1 OF 1	5


N
RIVER ROAD
ACTIVE
INACTIVE
ACTIVE
PROPOSED BUILDING 400
(UNDER CONSTRUCTION)
PROPOSED BUILDING 500
PROPOSED BUILDING 700
FORMER
CELOTEX
PROPERTY
AOC 3
AOC 3
AOC 2
AOC 6
AOC 7
AOC 1
AOC 3
TRAILER 1
TRAILER 2
AOC 4
FORMER
BOILER
ROOM
AOC 5
ACTIVE
LEFT
TURN
LANE
ACTIVE
STORAGE
AREA
EXISTING BLUE
CORRUGATED METAL
BUILDING
AOC 4
AOC 8
AOC 9
NON-HAZARDOUS
CONSTRUCTION
MATERIALS
INSPECTION AREA
(APPROXIMATE)/
LIMIT OF RESTRICTED
WORK AREA
EASEMENT
QUANTA
RESOURCES
SUPERFUND
SITE
LEGEND
PROPERTY LINE
ESAEMENT - QUANTA SITE
INSPECTION AREA
EXISTING CHAIN-LINK FENCE
EXISTING
HAIN-LINK
FENCE
PROPERTY
BOUNDARY
AOC NO. DESCRIPTION
1 Chemical Handling and Storage Area - Trailer 2 Interior
2 Empty Electrical Equipment Cases - Trailer 2 Exterior
3 Drum Storage Areas - Exterior
4 Chemical Handling and Storage Area - Metal Building Interior
5 Subsurface Pipe - Metal Building Interior (Boiler Room)
6 Soil Pile - Metal Building Exterior
7 C&D Pile with Asphalt Shingles - Metal Building Exterior
8 Battery Storage Area - Metal Building Exterior
9 Oily Bucket and Surface Oil Stain - Metal Building Exterior
SOURCE:
DRAI FIGURE 2 "SITE PLAN, EASEMENT AND INSPECTION AREAS AND AREAS OF ENVIRONMENTAL CONCERN" DATED MAY 2003.
0 60 FT.
APPROXIMATE SCALE
Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041
SITE RECONNAISSANCE FINDINGS
Former Celotex Industrial Park - Edgewater, NJ
PREPARED BY: RL/LB
DATE: MAY 2003
JOB NO.: 01C2084-Q
FIGURE: 6
2084-Q-2 -05/14/03

304563

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FIGURE TITLE

RIVER ROAD ACCESS EXHIBIT

THE PROMENADE
BLOCK 91 - LOT 1
225 RIVER ROAD
EDGEWATER, NJ 07020

McNALLY ENGINEERING, L.L.C.
(CERTIFICATE OF AUTHORIZATION 24GA27928700, Exp. 06/30/04)
393 RAMAPO VALLEY ROAD
SUITE 1
OAKLAND, NJ 07436
(201) 337-9051

SCALE	DATE :	SHEET No.:	FIGURE No.:
1" = 20'	05/07/03	1 OF 1	7

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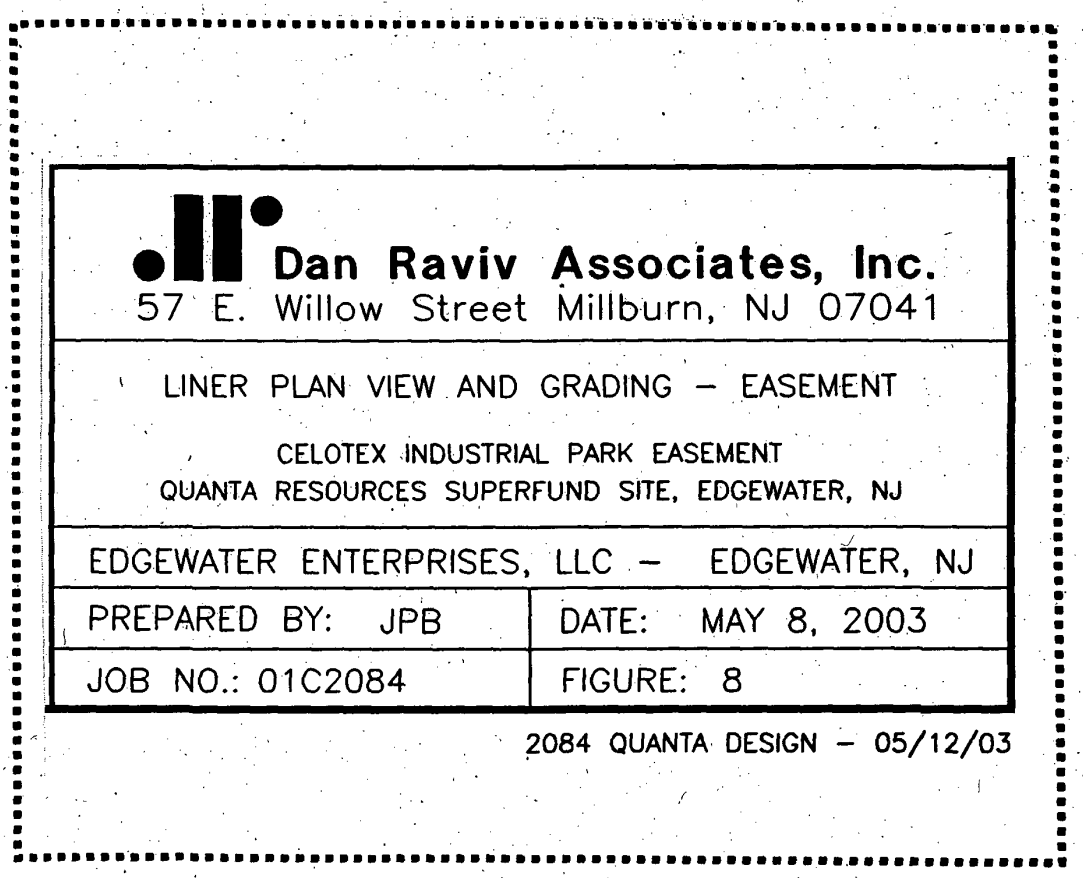

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

LINER PLAN VIEW AND GRADING – EASEMENT

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE, EDGEWATER, NJ

EDGEWATER ENTERPRISES, LLC – EDGEWATER, NJ

PREPARED BY: JPB	DATE: MAY 8, 2003
JOB NO.: 01C2084	FIGURE: 8

2084 QUANTA DESIGN – 05/12/03

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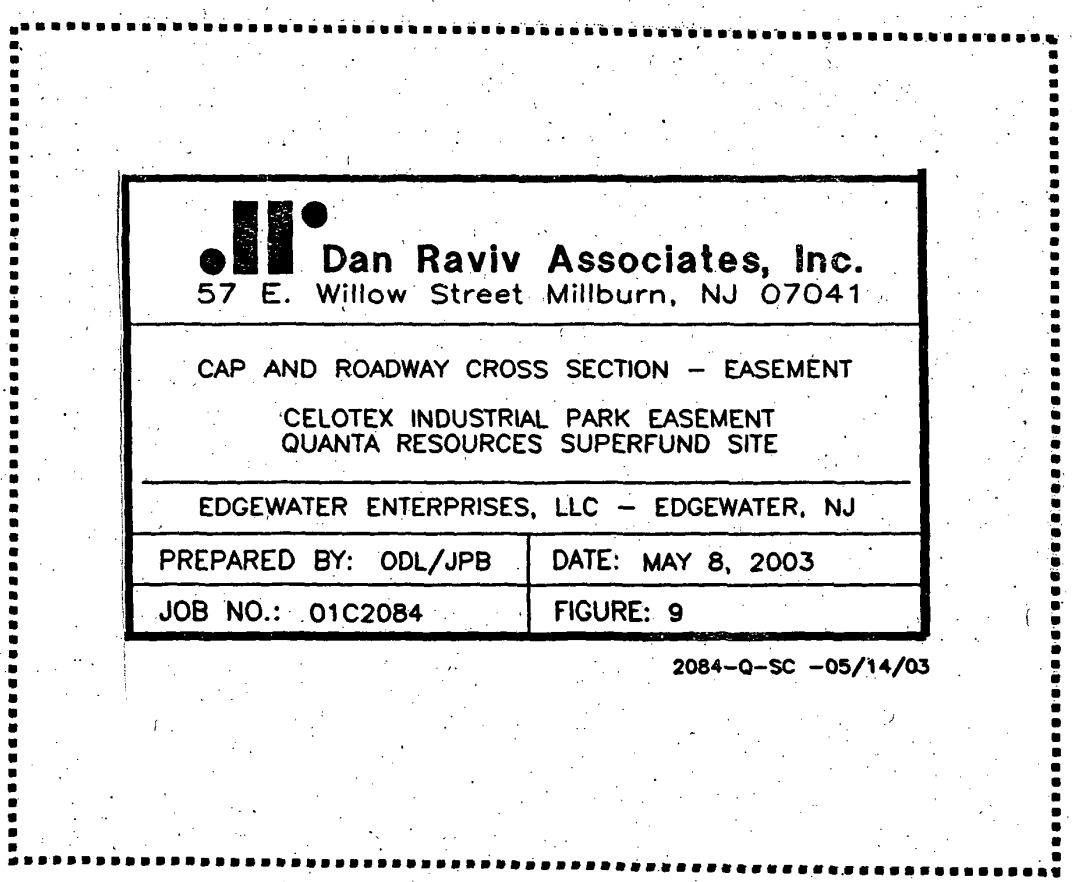

Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

CAP AND ROADWAY CROSS SECTION – EASEMENT

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE

EDGEWATER ENTERPRISES, LLC – EDGEWATER, NJ

PREPARED BY: ODL/JPB	DATE: MAY 8, 2003
JOB NO.: 01C2084	FIGURE: 9

2084-Q-SC -05/14/03

304566

APPENDICES

APPENDIX A

APPENDIX A

Metes and Bounds Description of Easement

McNALLY ENGINEERING, L.L.C.

ENGINEERING · SURVEYING · PLANNING
393 RAMAPO VALLEY ROAD, SUITE 1, OAKLAND, NEW JERSEY 07436
(201) 337-9051 FAX (201) 337-3391 E-MAIL: MMcNally@McNallyEng.com

DESCRIPTION FOR PROPOSED SLOPE, UTILITY AND ACCESS PARCEL LOT 1 in BLOCK 95 (TAX ASSESSMENT MAP DESIGNATION) IN THE BOROUGH OF EDGEWATER, BERGEN COUNTY, NEW JERSEY

Beginning at a point which stands as the south westerly property corner of Lot 3, Block 92 also shown as Tract 1 on the map entitled "Final Subdivision Plat Glenwood Mall Tax Map Sheet #8 Lots 4.01 & 5 Block 91 and Portion of Lots 3 & 4 Block 92, Edgewater, New Jersey" dated November 21, 1997, last revised July 7, 1998 prepared by McNally Engineering with said point having New Jersey Plane Coordinates (1927) of 719,418.134 north and 2,186,930.156 east; and running thence,

1. South 69 degrees 30 minutes 46 seconds east 276.16 feet to a point; thence:

2. South 86 degrees 03 minutes 44 seconds west 35.23 feet to a point; thence:

3. North 83 degrees 24 minutes 37 seconds west 88.05 feet to a point; thence:

4. Along a tangent curve to the right, having an arc radius of 146.00 feet, an arc length of 35.41 feet, a central angle of 13 degrees 53 minutes and 42 seconds, a chord length of 35.32 feet and a chord bearing of north 76 degrees 27 minutes 46 seconds west, to a tangent point; thence:

5. North 69 degrees 30 minutes 55 seconds west 42.08 feet to a point; thence:

6. Along a tangent curve to the left, having an arc radius of 103.00 feet, an arc length of 141.20 feet, a central angle of 78 degrees 32 minutes and 47 seconds, a chord length of 130.40 feet and a chord bearing of south 71 degrees 12 minutes 42 seconds west, to a tangent point; thence:

7. South 31 degrees 56 minutes 18 seconds west 81.33 feet to a point; thence:

EXHIBIT A

8. South 17 degrees 17 minutes 05 seconds east 30.61 feet to a point; thence:

9. South 72 degrees 42 minutes 55 seconds west 72.00 feet to a point; thence:

10. North 31 degrees 55 minutes 50 seconds east 52.66 feet to a point; thence:

11. North 31 degrees 55 minutes 50 seconds east 43.20 feet to a point; thence:

12. North 58 degrees 04 minutes 10 seconds west 5.00 feet to a point; thence:

13. North 40 degrees 21 minutes 57 seconds east 45.00 feet to a point; thence:

14. North 27 degrees 26 minutes 31 seconds east 64.00 feet to a point; thence

15. North 25 degrees 04 minutes 48 seconds east 31.50 feet to a point; thence:

16. South 68 degrees 07 minutes 39 seconds east 14.00 feet to a point; thence:

17. North 21 degrees 52 minutes 21 seconds east 9.00 feet to a point; thence:

18. North 68 degrees 07 minutes 39 seconds west 5.13 feet to a point; thence:

19. North 31 degrees 55 minutes 50 seconds east 30.18 feet to a point; thence:

20. North 69 degrees 30 minutes 46 seconds east 19.01 feet to the ending point of the proposed slope, utility and access parcel.

Containing 0.39 acres, more or less considered the same.

APPENDIX B

APPENDIX B

Hazardous Substances Disposal Plan

APPENDIX B

HAZARDOUS SUBSTANCES DISPOSAL PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY
INDEX No. 02-2003-2014

Prepared For:

Edgewater Enterprises, LLC
525 River Road
Edgewater, New Jersey

Prepared By:

Dan Raviv Associates, Inc.
57 East Willow Street
Millburn, New Jersey

May 16, 2003

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APPENDIX B

HAZARDOUS SUBSTANCES DISPOSAL PLAN
CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

1.0 INTRODUCTION

Dan Raviv Associates, Inc. (DRAI) has prepared this H*azardous Substances Disposal Plan* (Plan) on behalf of Edgewater Enterprises, LLC pursuant to the Administrative Order on Consent (Order) entered into by Edgewater Enterprises and the U.S. Environmental Protection Agency (EPA) on March 21, 2003 regarding the use and remediation of an Easement on a portion of the Quanta Resources Superfund Site (Quanta site), in Edgewater, New Jersey.

The RAW proposes installation of a cap over the Easement area in the defined in the Order, and construction of an access road for the residential/commercial development under construction on the adjacent former Celotex property. In accordance with the Order (Section 31, Task 4), structures, underground pipes, underground storage tanks (USTs), or other waste that may be encountered within the Easement during the performance of work are to be removed. Prior to demolition of the structures (see Demolition and Non-Hazardous Waste Disposal Plan), all hazardous substances will be removed from the Easement and disposed of in accordance with this plan. This Plan addresses the removal and disposal of hazardous substances within the Easement in accordance with the Order.

2.0 SUMMARY OF WASTE MATERIALS

DRAI conducted a site inspection of the Easement on April 17, 2003 and prepared an Environmental Assessment Report (EA Report), which is being submitted to the USEPA with the RAW under separate cover.

Based on the EA Report, nine (9) areas of concern (AOCs) were identified, eight (8) of which contain or potentially contain hazardous substances. Please refer to the EA Report for a complete description of the AOCs. A listing of the Hazardous Substances per AOC is provided on Table B-1.

The AOCs that contain hazardous or potentially contain hazardous substances that will require disposal (i.e., containerized liquid chemicals and asphalt shingles) are listed below along with the associated waste material and disposal method.

AOC Nos.	Waste Material	Disposal Method	Estimated Volume
1	Containerized Liquids	Lab Pack and Off-site disposal	Max 55-gallons
2	Electrical Equipment Cases	Re-package and Off-site disposal	3 units
3	Drummed liquids	Containerized/Off-site disposal	Four 55gallons drums
4	Containerized Liquids	Lab Pack and Off-site disposal	Max 55-gallons
8	Batteries	Off-site recycling facility	18 batteries
9	Oily water	Containerized/Off-site disposal	5-gallons

Waste Identification/Classification for Disposal

Containerized substances in the listed AOCs will require consolidation in Lab Packs for smaller containers, and waste classification sampling, and RCRA Characterization and TCLP sampling and analysis for drummed liquids. The Lab Packs and drums will be handled and disposed by Clean Harbors, Inc., in accordance with their Drum Handling Guidelines included in Appendix E.

3.0 CONTRACTORS AND FACILITIES

Clean Harbors will transport and dispose of all hazardous substances to a permitted treatment, storage, or disposal facilities (TSDF), in accordance with applicable federal and state regulations (RCRA, TSCA, HMTA and NJAC).

The names and addresses of all TSDFs selected to receive wastes from the Site will be provided to the EPA at least five (5) days prior to off-Site shipment of such wastes for the USEPA's review and approval. Following the ultimate disposal of wastes, disposal documentation from the disposal facilities used for all wastes shipped off-site will be provided to the USEPA.

All hazardous materials leaving the Site will be transported in accordance with federal and state requirements. Records for removal of materials will be maintained, including the quantity of wastes that are removed, and the destination of such wastes. These records will be in the form of manifests, bills of lading, invoices, and/or gate receipts.

4.0 HEALTH AND SAFETY

The site health and safety procedures identified in lean Harbors' Site Specific Health and Safety Plan, provided to the USEPA on April 3, 2003, will be implemented for all of the proposed site work.

Table B - I
Hazardous Substances per AOC

AOC 1 (TRAILER 2)

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Acetone	67-64-1	1 X 8 pints	empty
Alcohol Solvent	----	1 X 16 oz.	----
Benzene	71-43-2	1 X 5 gallons	empty
Copper Sulfate	7758-98-7	1 X 6 oz.	----
Flammable Liquid	----	2 X 1 gallon	unknown type
Fuel Oil Conditioner	----	----	empty
Hydrochloric Acid	7647-01-0	1 X 8 oz.	50 % concentration
Methyl Orange	140-56-7	1 X 6 oz.	dye
Mineral Oil	----	2 X 800 ml	----
Muriatic Acid	7647-01-0	1 X 1 gallon	----
Potassium Hydroxide	1310-58-3	1 X 500 ml	45 % concentration
Sodium Hydroxide	1310-73-2	1 X 2 gallons	----
Sulfuric Acid	7664-93-9	1 X 1 liter	50 % concentration
Toluene	108-88-3	1 X 8 pints	partial
Toluene	108-88-3	1 X 5 gallons	empty
Toluene	108-88-3	1 X 16 oz.	----
Toluene	108-88-3	1 X 12 oz.	----
Unknown Liquid	----	1 X 5 gallons	----
Unknown Liquid	----	1 X 32 oz.	----
Unknown Liquid	----	2 X 1 gallon	----

AOC 3

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Unknown Liquid	----	1 X 55 gallon poly drum	----
Unknown Liquid	----	2 X 55 gallon	One contains a small amount of liquid Ph 3

AOC 4 (METAL BUILDING)
(Interior Storage Area)

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Oil Drums	----	----	----
Paint Cans	----	1 X 1 gallon	----
Propane	74986	1 X cylinder	----
Spray Paint Cans	----	----	----

Table B - I
Hazardous Substances per AOC

AOC 4 (METAL BUILDING)
(Interior Boiler Room)

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Car Batteries	----	----	----
Potassium Iodide	7681-11-0	1 X 32 oz.	----
Propane	74986	1 X small cylinder	----
Propane	74986	1 X large cylinder	----
Silver Nitrate	7761-88-8	1 X 32 oz.	----
Starch Indicator	----	----	----
Sulfuric Acid	7664-93-9	1 X 32 oz.	----

AOC 8

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Lead/Acid Batteries	----	18 cells	----

AOC 9

Material Name	CAS # (if known)	Container Size (number X size)	Notes
Oily Water	----	1 X 5 gallon	----

APPENDIX C

APPENDIX C

Demolition and Non-Hazardous Materials Disposal Plan

APPENDIX C

DEMOLITION AND NON-HAZARDOUS MATERIALS DISPOSAL PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY
INDEX No. 02-2003-2014

Prepared For:

Edgewater Enterprises, LLC
525 River Road
Edgewater, New Jersey

May 16, 2003

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LIST OF FIGURES

DEMOLITION AND NON-HAZARDOUS MATERIALS DISPOSAL PLAN
CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

1.0 INTRODUCTION

This *Site Specific Demolition and Non-Hazardous Materials Disposal Plan* (Plan) has been prepared on behalf of Edgewater Enterprises, LLC pursuant to the Administrative Order on Consent (Order) entered into by Edgewater Enterprises and the U.S. Environmental Protection Agency (USEPA) on March 21, 2003 regarding the use and remediation of an Easement on a portion of the Quanta Resources Superfund Site (Quanta site), in Edgewater, New Jersey. This Plan is an appendix to the *Remedial Action Workplan* (Workplan) prepared by DRAI.

Edgewater Enterprises will cap an area of contamination located on the Easement (Figure 1), and build an access road for the residential/commercial development under construction on the adjacent former Celotex property. In accordance with the Order (Section 31, Task 4), structures, underground pipes, underground storage tanks (USTs), or other waste that may be encountered within the Easement during the performance of work are to be removed. This Plan addresses the removal and disposal of structures and other non-hazardous materials within the Easement. Refer to Workplan Appendix B (*Hazardous Substances Disposal Plan*) for the disposal of hazardous substances, and Workplan Appendix D (*Geophysical Investigation Scope of Work*) for procedures to identify any underground pipes or USTs.

The Quanta site currently has numerous piles of debris within the proposed easement, as well as three building structures that will require demolition and disposal. A site inspection of the Easement was conducted on April 17, 2003. The *Environmental Assessment Site Reconnaissance Report*, being submitted to USEPA under separate cover, includes a complete description of the structures, debris and wastes that were identified within (or partially within) the Easement during the site inspection.

1.1 Scope of Work

This Plan describes the removal (or demolition) methods proposed for the three structures on the Quanta site: the blue corrugated metal building and the two office trailers. It is assumed that all hazardous substances will be removed from the Easement prior to demolition activities, and disposed of in accordance with the *Hazardous Substances Disposal Plan* (see Section 3.2 and Appendix B of the Workplan).

This Plan also includes disposal procedures for any non-hazardous materials and/or debris produced as a result of demolition activities, as well as for any other non-hazardous materials on the Easement.

2.0 CONTRACTORS AND FACILITIES

There are four major parties involved in the demolition of the three structures and disposal of non-hazardous materials and debris present on the site:

- Demolition Contractor: M&M Contracting and Consulting Inc., Jersey City, New Jersey
- Non-Hazardous Materials Hauler:
  - Nacirema Environmental Services Company, Inc., Bayonne, New Jersey
  - Meadow Management, Inc. – Newark, New Jersey (scrap metal)
- Disposal Facilities:
  - Hackensack Meadowlands Development Commission (HMDC) Landfill – Kearney, New Jersey
  - Meadow Management, Inc. - Newark, New Jersey (metal scrapyard)

2.1 Permits and Certifications

All demolition and disposal permits will be obtained prior to commencement of any demolition work on the site. Permits will include the Town of Edgewater Site Demolition Permit, Disposal Facility Permits, and the Waste Hauler Permit. The following certifications will be verified in writing:

a) Demolition Contractor Certification
b) Utility Shut-Off Certification

3.0 REMOVAL AND DEMOLITION ACTIVITIES

This section explains the various tasks that are necessary to complete the demolition work and disposal of all non-hazardous materials.

3.1 Methods

Both demolition and non-hazardous materials disposal methods will be described in this section of the Plan. It is assumed that all hazardous substances will be removed from the Easement prior to demolition activities, and disposed of in accordance with the Hazardous Substances Disposal Plan (see Section 3.2 and Appendix B of the Workplan). Figure 1 illustrates the three structures to be demolished and the Easement described above.

3.1.1 Demolition Work

M&M Consulting and Contracting, Inc. (M&M) has been retained by Edgewater Enterprises, LLC as the contractor for the demolition work, and has provided the following description of demolition activities:

Demolition Equipment

Daewoo 220 Excavator with a grapple

Demolition Methods

a) Remove steel building (blue building) approximately 120' x 40' to the existing pad. M&M will be complete this task by knocking down the building and transporting the debris to Nacirema Environmental Services Company, Inc. (Nacirema) trucks for disposal (see Section 3.1.2 below). As provided in the Order, the concrete pad will be left in place.

b) Two office trailers are to be crushed flat by M&M, and then loaded onto Nacirema trailers for disposal (see Section 3.1.2 below).

c) Minimal hand labor work will be required for this demolition job.

3.1.2 Non-Hazardous Materials Disposal Work

The following describes the procedures for handling and disposal of all non-hazardous materials and/or debris generated or encountered during work.

Disposal Methods

a) All steel will be separated by M&M, loaded onto Meadow Management, Inc. (Meadow Management) dump trucks, and hauled by Meadow Management to its scrap yard in Newark, New Jersey.

b) The Remaining non-hazardous materials and debris from the Easement will be loaded by M&M into Nacirema roll-off containers, transported by Nacirema, and disposed of at the HMDC Landfill in Kearny, New Jersey.

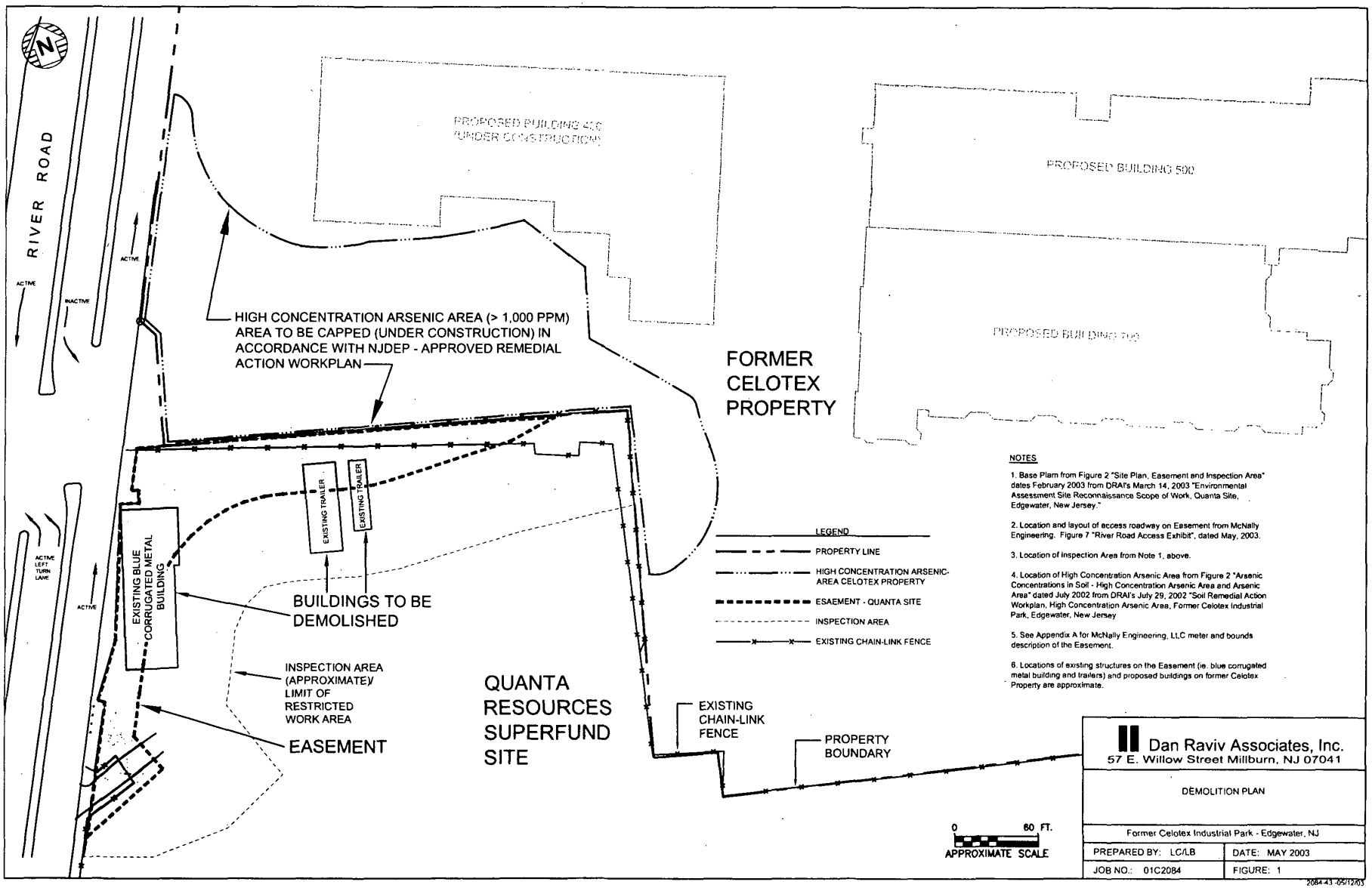
All disposal activities will be conducted in accordance with USEPA procedures and OSHA regulations. M&M will maintain records of the quantity of non-hazardous waste materials removed for disposal, and their destination.

4.0 HEALTH AND SAFETY

Site Health and Safety during the demolition work, will be the responsibility of the Demolition Contractor. This will be conducted as indicated in the Site Specific Demolition Health and Safety (H&S) Plan, submitted under a separate cover as a separate Appendix (Appendix G) to the Workplan.

4.1 Decontamination Procedures

Additional health and safety procedures, including delineation of work safety zones and equipment (both expendable and non-expendable) decontamination procedures, will be in accordance with the general H&S Plan prepared by Environmental Waste Management Associates (EWMA) for performance of remedial activities at the former Celotex property (EWMA, 2001). This H&S Plan was submitted to USEPA during the site inspection on April 17, 2003.



NOTES

1. Base Plam from Figure 2 "Site Plan, Easement and Inspection Area" dates February 2003 from DRAI's March 14, 2003 "Environmental Assessment Site Reconnaissance Scope of Work, Quanta Site, Edgewater, New Jersey."

2. Location and layout of access roadway on Easement from McNally Engineering. Figure 7 "River Road Access Exhibit", dated May, 2003.

3. Location of Inspection Area from Note 1, above.

4. Location of High Concentration Arsenic Area from Figure 2 "Arsenic Concentrations in Soil - High Concentration Arsenic Area and Arsenic Area" dated July 2002 from DRAI's July 29, 2002 "Soil Remedial Action Workplan, High Concentration Arsenic Area, Former Celotex Industrial Park, Edgewater, New Jersey

5. See Appendix A for McNally Engineering, LLC meter and bounds description of the Easement.

6. Locations of existing structures on the Easement (ie. blue corrugated metal building and trailers) and proposed buildings on former Celotex Property are approximate.

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DEMOLITION PLAN

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: LC/LB	DATE: MAY 2003
JOB NO.: 01C2084	FIGURE: 1

2084-43-05/12/03

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APPENDIX D

APPENDIX D

Geophysical Investigation Scope of Work

APPENDIX D

GEOPHYSICAL INVESTIGATION SCOPE OF WORK

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY
Index Number CERCLA 02-2003-2014

Prepared for:

Edgewater Enterprises, L.L.C.
525 River Road
Edgewater, New Jersey

May 16, 2003

GEOPHYSICAL INVESTIGATION SCOPE OF WORK
CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

Geophysical Investigation

Advanced Geological Services (AGS), of Malvern, Pennsylvania and Dan Raviv Associates, Inc. (DRAI) have prepared this Scope of Work (SOW) on behalf of Edgewater Enterprises, LLC pursuant to the Administrative Order on Consent (Order) entered into by Edgewater Enterprises and the U.S. Environmental Protection Agency (USEPA) on March 21, 2003. The Order provides for the construction of a cap and access roadway over an area of contamination located on an Easement that includes a portion of the former Celotex Industrial Park property (Celotex Property) and a portion of the Quanta Resources Superfund Site (Quanta Site) in Edgewater, New Jersey. This SOW is an appendix to the *Remedial Action Workplan* (Workplan) being prepared by DRAI.

In accordance with the Order (Section 31, Task 4), structures, underground pipes, underground storage tanks (USTs), or other waste that may be encountered within the Easement during the performance of work are to be removed. Sections 3.2 and 3.4 of the Workplan discuss the demolition and disposal of structures, debris and other waste material that are located above ground. A geophysical investigation will be performed to identify underground features following demolition of the buildings and removal of materials from the Easement.

To determine if subsurface USTs or underground piping are present in the Easement, an integrated geophysical investigation using ground penetrating radar (GPR) and high-sensitivity metal detector (EM61) will be performed by AGS. A Statement of Qualifications for AGS is provided under separate cover.

Integrating two geophysical techniques provides a complementary effect resulting in higher confidence levels and more complete subsurface information by reducing the inherent ambiguities in interpretation that may exist if only one method was used. The EM61 will be used to scan the entire survey area for the presence of buried metal objects. The GPR method will be used to locate and determine the shape and depth of burial of significant EM anomalies, and to provide subsurface imaging at locations that cannot be accessed with the EM instrument.

Time Domain Electromagnetic Metal detector (EM61)

Buried metal objects such as USTs can be effectively located using a Geonics EM61 High-Sensitivity Metal Detector. The EM61 is a time domain electromagnetic (EM) system that can discriminate between conductive soils and metal objects.

The EM61 generates rapid electromagnetic pulses and measures the response of the subsurface between pulses. Secondary EM fields are generated in the ground after each pulse. These fields dissipate rapidly in earth materials but remain for a longer time in

buried metal objects. The EM61 measures the prolonged metal response only after the earth response has dissipated.

For this investigation the EM61 data will be collected at approximately 2.5-foot intervals along parallel lines spaced approximately 5 feet apart. Data will be processed and interpreted in the field to identify buried metal objects that could potentially indicate the presence of any USTs, and help direct the subsequent survey activities.

Ground Penetrating Radar (GPR)

The GPR method uses focused high-frequency electromagnetic pulses to produce a continuous, cross-sectional image of the subsurface. These pulses are rapidly transmitted into the subsurface using an antenna. When the pulses reach a layer or object possessing contrasting electrical properties, part of the energy is reflected back to the surface where it is detected by a receiving antenna. The received signal is sent to a controlling unit where it is processed and displayed in real time to allow in-field interpretations. The data are also digitally recorded for high-resolution computer processing. A continuous cross-sectional image is generated as the receiving and transmitting antennas are pulled along the ground surface. The system records the continuous image by plotting the two-way travel time of the reflected signal versus distance the antenna traveled along the ground surface. Two-way travel time values are then converted to depth using known velocity functions.

A GSSI SIR-2 Subsurface Interface Radar System with 400 and/or 200 megahertz (MHz) antenna will be used to characterize subsurface features. The most effective recording window and antenna will be selected after on-site testing to provide the required depth penetration (approximately 10 feet) and subsurface detail. The data will be acquired along orthogonal traverses spaced approximately 5 feet apart over significant EM anomalies, or at locations where meaningful EM data cannot be acquired.

Findings/Deliverables

Upon completion of the fieldwork, all data will be returned to the AGS office for analysis, correlation, and final interpretation. A report will be prepared, which will include a description of services provided, equipment used during the investigation, overall results of the investigation, color-enhanced plan map that will illustrate the interpreted locations of detected anomalies, and representative relevant GPR images, if applicable.

Results of the investigation will be forwarded to USEPA for review and approval. Based on the absence of any significant geophysical anomalies that exhibit linear trends (suspected tanks or pipes), no further investigation regarding subsurface conditions will be performed.

If the investigation indicates the presence of linear trends suggesting subsurface tanks or piping, test pits will be excavated by ROC Contractors, Inc., Maywood, NJ (Edgewater Enterprises' excavation contractor) to determine if these structures exist.

If test pits confirm the presence of USTs and/or underground piping, these structures will be removed in accordance with N.J.S.A. 58:10A-21 *et seq*. Post-excavation soil sampling (for full TAL/TCL parameters) will also be in accordance with NJDEP Technical Requirements for Site Remediation (N.J.A.C 7:26E) for the removal of USTs and/or piping. Removal activities will be conducted under the supervision of a DRAI representative in accordance with the appropriate Disposal Plan (see Appendices B and C of the Workplan). All soils generated during investigation and removal activities will be returned to the excavation.

APPENDIX E

APPENDIX E

Sampling and Analysis Plan

APPENDIX E

SAMPLING AND ANALYSIS PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

DRAI JOB NO. 01C2084

Prepared for:

Edgewater Enterprises, L.L.C..
525 River Road
Edgewater, New Jersey

Prepared by:

Dan Raviv Associates, Inc.
57 East Willow Street
Millburn, NJ 07041

May 16, 2003

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APPENDIX E

SAMPLING AND ANALYSIS PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

DRAI JOB NO. 01C2084

1.0 INTRODUCTION

Dan Raviv Associates, Inc. (DRAI) has prepared this Sampling and Analysis Plan for the Quanta Resources Superfund Site Easement Area in conjunction with the Cap and Access Roadway Remedial Action Workplan (Easement RAW), submitted as requested by the United States Environmental Protection Agency (USEPA) in the Order of Consent signed by Edgewater Enterprises L.L.C. (Edgewater Enterprises) and USEPA on March 21, 2003.

The sampling and analysis plan provides for collection of:

- Soil samples for the analysis of USEPA full Target Compound List/Target Analyte List (TCL/TAL);
- Asphalt shingle samples for asbestos analysis; and
- Containerized liquid chemicals for full Toxic Characteristic Leachate Procedure (TCLP) and RCRA characteristic waste identification and disposal parameters.

This plan also provides for contingency soil sampling and analysis to document the soil quality associated with any underground structures that may be identified as a result of the proposed geophysical investigation (see Easement RAW, Appendix D).

2.0 SAMPLING SUMMARY

Nine Areas of Concern (AOCs) have been identified on the Celotex Roadway Easement at the Quanta Site, based on the Environmental Assessment Report, submitted with the Easement RAW under separate cover. The AOC locations are presented on Figure 1 and sampling parameters, sample depths, number of samples, identification number and sample matrices are listed on Table E-1. A summary of the AOCs requiring soil sampling and waste identification sampling is provided below:

2.1 Soil Sampling

AOC #2 – Electrical Equipment Cases

- One soil sample per case (3 samples total) will be collected from the first 6-inch soil interval at the ground surface where opening meets the ground.
- Analysis: polychlorinated biphenyls (PCBs)

AOC #3 – Drum Storage

- One soil sample from drummed soil
- Analysis: Full TCL/TAL
- Liquid drum sampling is addressed in Section 2.2, below

AOC #6 – Soil Pile

- One soil sample from the soil pile from the worst-case 6-inch interval based on field PID screening.
- Analysis: Full TCL/TAL

AOC #7 – Asphalt Shingles

- Three samples from shingles in the C&D pile.
- Analysis: Asbestos via Polarized Light Microscopy (PLM)

AOC #8 – Battery Storage Area

- One soil sample from the 0 to 6-inch depth interval beneath the batteries upon removal
- Analyze for TAL Metals

AOC #9 – Oily Bucket and Surface Soil Stain

- One soil sample at the 0 to 6-inch depth interval in the worst-case location of soil staining based on visual observation at the time of sampling.
- Analysis: Full TCL/TAL

2.2 Waste Identification/Classification for Disposal

Containerized substances in 3 of the 9 AOCs will require consolidation in Lab Packs for smaller containers, and waste classification sampling, and RCRA Characterization and TCLP sampling and analysis for drummed liquids. The Lab Packs and drums will be handled and disposed by Clean Harbors, Inc. in accordance with their Drum Handling Guidelines (Attachment 1).

AOC #1 –Chemical Storage Area (Trailer 2)

- All of the hazardous substances present in the Trailer 2 (per the EA Report) will be categorized in the field and consolidated in lab packs by Clean Harbors, in accordance with their Drum Handling Guidelines (Attachment 1).
- An inventory of all materials removed from Trailer 2 will be maintained.

AOC #3 – Drum Storage Area (Liquid)

- One liquid sample from each of the 2 drums (2 samples total) will be collected
- Analysis: RCRA characteristics and full TCLP
- Soil drum sampling is addressed in Section 2.1 above.

AOC #4 – Chemical Storage Area (Metal Building)

- All of the hazardous substances present in the Trailer 2 (per the EA Report) will be categorized in the field and consolidated in lab packs by Clean Harbors, in accordance with their Drum Handling Guidelines (Attachment 1).
- A full inventory of hazardous substances will be completed when the contents are removed and consolidated by Clean Harbors.
- An inventory of all materials removed from both the Boiler Room and the Storage Area will be maintained.

3.0 METHODS, QUALITY ASSURANCE AND REPORTING

All sampling and analysis will be performed in accordance with the New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation N.J.A.C. 7:26E and the Quality Assurance/Quality Control (QA/QC) Plan, found as Attachment 1 of Appendix F.

The samples will be collected using dedicated stainless steel sampling utensils and laboratory supplied glassware, and preserved and transported to a New Jersey Certified Laboratory under chain of custody, pursuant to the QA/QC. Integrated Analytical Laboratories, LLC (IAL), a New Jersey Certified Laboratory, has been selected as the laboratory that will be performing the sample analysis. IAL's QA/QC is included in Appendix F.

The sample analysis for the parameters listed on Table E-1 will be performed by the laboratory in accordance with the QAPP using the procedures set forth in "Test Methods for Evaluating Solid Wastes" ("SW-846"), as required by the Order. The soil samples will be collected and analyzed pursuant to Method 5035 for the analysis of VOCs, including any post-excavation confirmatory samples that may be collected. Figure 1 and Table E-I include the sample locations, depths and designations; the number and types of samples to be collected and the analyses to be performed.

After receipt from the laboratory, all analytical data will be validated and submitted to EPA as a validation package (checklist, report and Form #1 containing the final data). All analytical data will be submitted to EPA in a CLP deliverables, or similar format.

4.0 HEALTH AND SAFETY

The sample collection activities will be conducted in accordance with the Site Specific Health and Safety Plan (HASP) that was submitted to the USEPA on April 3, 2003. As required by the Order, a map depicting all work and safety zones, including but not limited to: exclusion zones, contaminant reduction zones, staging and sampling areas, Waste segregation areas, and command posts, all located from fixed reference points and plotted to scale is included as an amendment to the HASP (Figure 2). A summary description of these areas is described below.

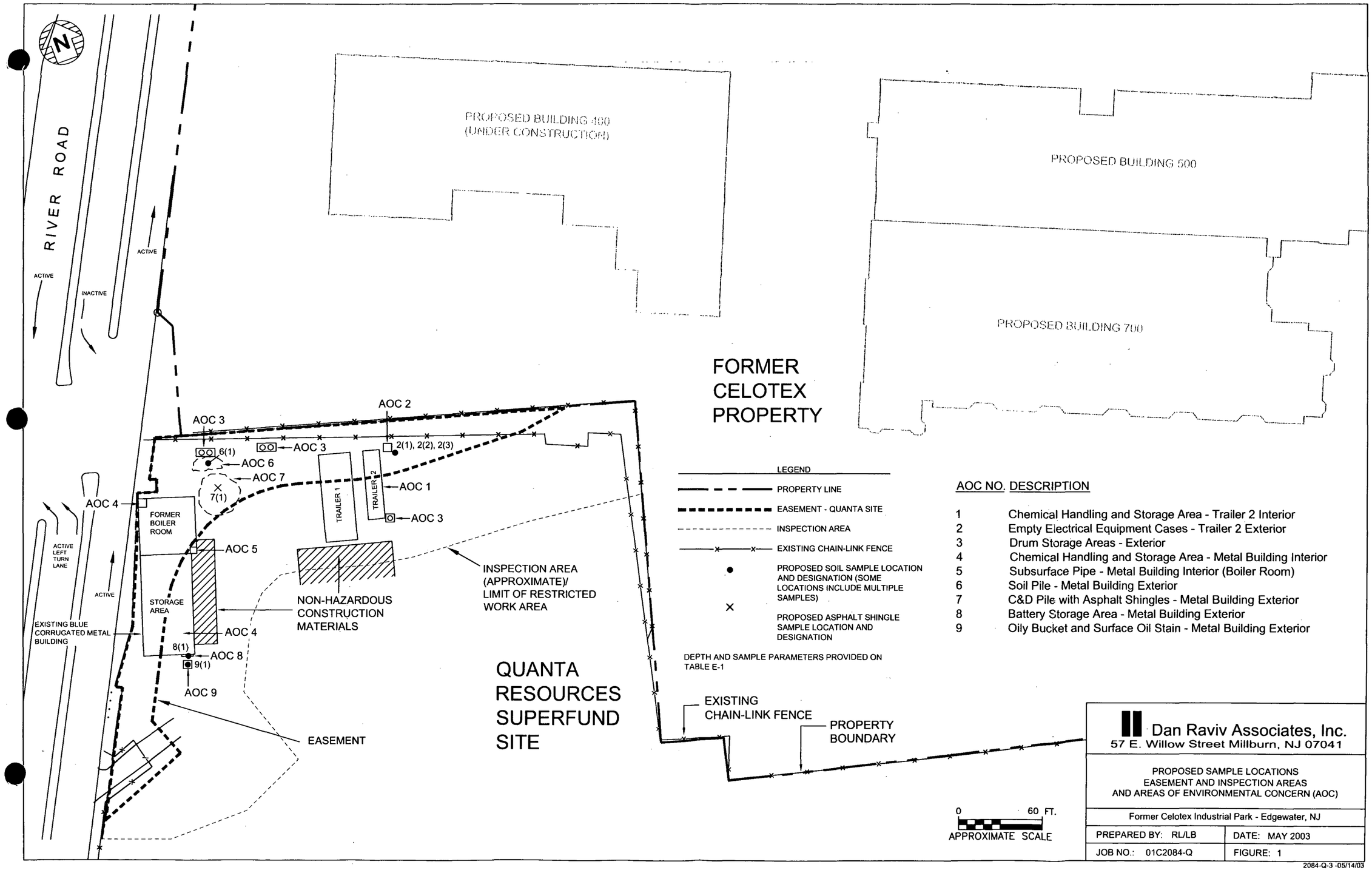
Delineation of Work Areas
The area at the site where field activities are conducted will be cordoned off. All associated equipment will remain in the restricted access areas. Only those persons with the prescribed level of personal protection in the HASP will be allowed to enter or exit these areas. All personnel and equipment will be decontaminated prior to leaving a restricted area.

The work area will include three separate zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone.

Exclusion Zone
The Exclusion Zone will consist of areas in the immediate vicinity of field activities (i.e., AOCs, staging areas, sample locations as shown on Figure 2). These areas will be clearly marked with barricade tape. Only authorized personnel will have access to the Exclusion Zone. An entry/exit check point will be established at the zone's periphery to regulate the flow of personnel and equipment and to ensure that procedures are followed.

Contamination Reduction Zone
The Contamination Reduction Zone (CRZ) will be located adjacent to the Exclusion Zone. All personnel entering or leaving the Exclusion Zone pass through this area to prevent cross-contamination. A contamination reduction corridor (CRC) will be established within the CRZ and will extend from the "hot-line" to the support zone. Access from the Support Zone to the Exclusion Zone will be accomplished only through the CRC. Decontamination of personnel will be performed within the CRZ. In addition, tools, equipment, or machinery will be decontaminated in a separate designated location within the CRZ.

Clean/Support Zone
The Support Zone will be used for rest periods, clean equipment storage and changing of clothing. Eating or drinking will be permitted in the Support Zone, only after washing face and hands. No smoking will be permitted in any on-site location.



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PROPOSED SAMPLE LOCATIONS
EASEMENT AND INSPECTION AREAS
AND AREAS OF ENVIRONMENTAL CONCERN (AOC)

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: RL/LB	DATE: MAY 2003
JOB NO.: 01C2084-Q	FIGURE: 1

2084-Q-3 -05/14/03

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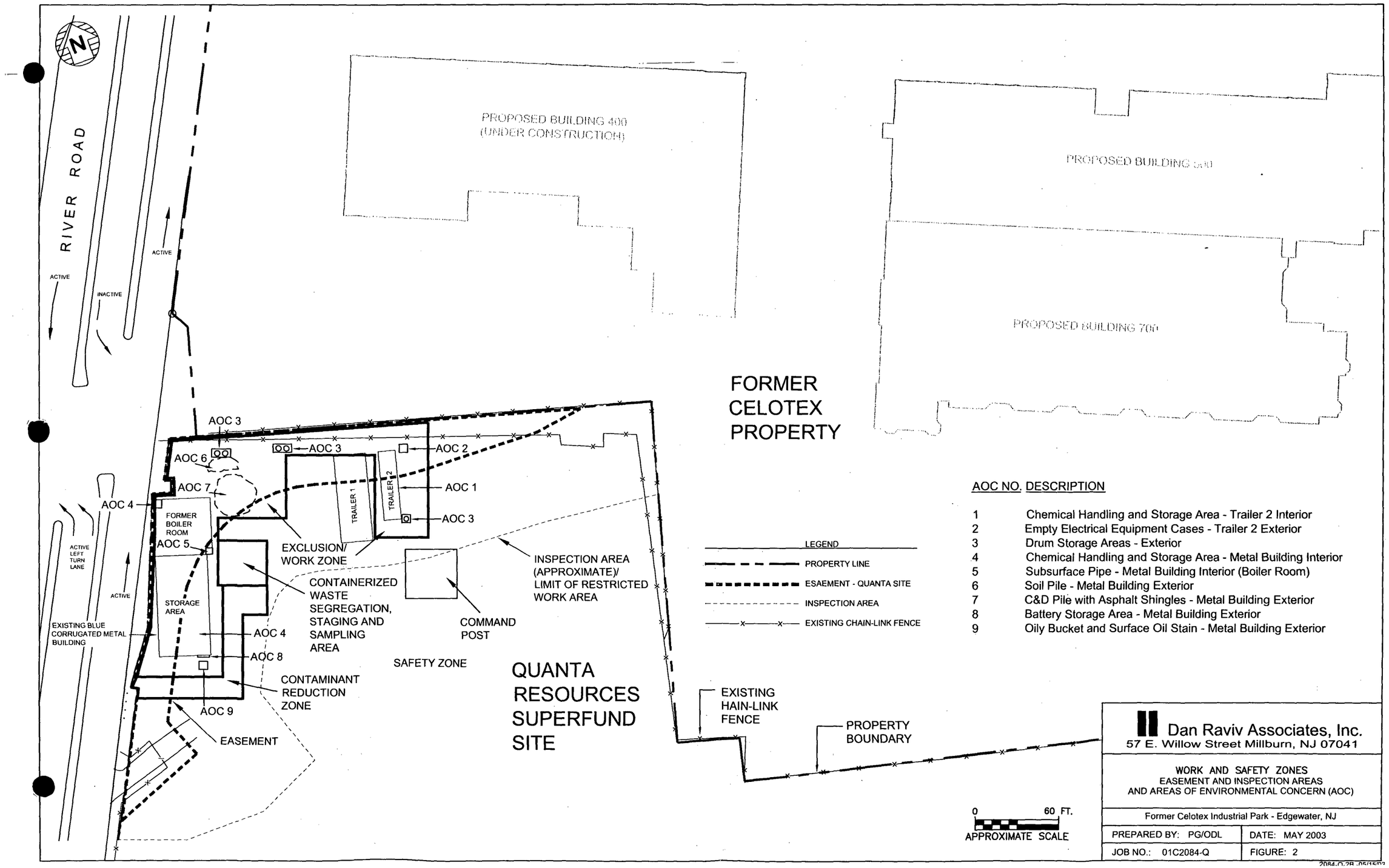

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WORK AND SAFETY ZONES
EASEMENT AND INSPECTION AREAS
AND AREAS OF ENVIRONMENTAL CONCERN (AOC)

Former Celotex Industrial Park - Edgewater, NJ

PREPARED BY: PG/ODL	DATE: MAY 2003
JOB NO.: 01C2084-Q	FIGURE: 2

2084-Q-2R -05/15/03

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TABLE E-I – AOCs AND SAMPLING DESCRIPTIONS

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

AOC	Sample No.	Depth Interval (ft below grade)	Number of Samples	Matrix	Parameter
#2	2(1)	0.5	1	Soil	PCBs
	2(2)	0.5	1	Soil	PCBs
	2(3)	0.5	1	Soil	PCBs
#3	3(1)	N/A	1	Liquid	Full TCLP and RCRA Waste Classification
#6	6(1)	0.5	1	Soil	Full TCL/TAL
#7	7(1)	N/A	1	Asphalt Shingles	Asbestos
#8	8(1)	0.5	1	Soil	TAL Metals
#9	9(1)	0.5	1	Soil	Full TCL/TAL

ATTACHMENT 1

Drum Handling Guidelines
Clean Harbors Environmental Services, Inc.

DRUM HANDLING GUIDELINES

Revision 1 5/2001

APPROVED

CHIEF OPERATING OFFICER
Signature Date

GENERAL COUNSEL
Signature Date

DIRECTOR OF HEALTH and SAFETY
Signature Date

Revision 1 5/2001

DRUM HANDLING GUIDELINES

Table of Contents

HANDLING DRUMS AND CONTAINERS

1. PURPOSE

The purpose of this document is to outline and provide Clean Harbors, Inc. employees with guidelines that should be followed when handling drums and containers during hazardous waste site operations and emergency responses. Various types of accidents may occur during the handling of drums and containers. While hazards are always present, proper work practices can minimize the risk to site personnel.

2. SCOPE

This guideline is designed to enable Clean Harbors, Inc. employees to identify and minimize the potential hazards associated with handling drums and containers.

3. GENERAL

3.1. Proper Selection of New Drums

Drums and containers to be used on-site will meet all Department of Transportation (DOT) requirements as stated in 49 CFR 100.100. (Contact your supervisor or the CHES Transportation Compliance Group if there are questions regarding DOT containers).

3.2. Drum/Container - Background Information

3.2.1. Prior to determining the appropriate method of handling and removal, it is necessary to visually inspect the container. This is necessary to develop information on the container, such as:

A. content;
B. sampling required for characterization;
C. potential for reaction, leakage, etc.;
D. containers that need to be moved;
E. ability to be moved; etc.

3.2.2. The information gathered will be used to classify the container and determine the safest handling method and the appropriate protection level necessary.

3.3. Buried Containers

3.3.1. Background information obtained during Site Characterization and Analysis should be used to identify and locate containers. Buried containers pose a difficult inspection problem; they must first be located. To accomplish this several techniques are available, some within Clean Harbors, others not. If buried containers are anticipated, it may be necessary to utilize this equipment. Alternative measures include reviewing site plans, deeds, etc.

A. Electromagnetic wave conductors;

B. Electric resistivity;
C. Ground penetrating radar;
D. Magnetometer - available through Engineering Group;
E. Metal Detector – possibly available through Engineering Group.

3.3.2. This equipment should be used to estimate the location and depth of any buried containers.

3.3.3. The following list the purpose and information and advantages and disadvantages of various methods to locate buried container.

A. Geophysical Surveying

Prior to the excavation or the unearthing of any buried drums a geophysical survey shall be conducted on the proposed work area.

B. Purpose

The purpose of conducting the survey is to provide information in the following areas:

1. Estimated location of the buried drums;
2. Estimated boundaries of the buried drums;
3. Estimated depth of the buried drums;
4. Estimate the number of buried drums; and
5. Estimate the extent of leakage of material from the buried drums.

C. Methods of Detection

There are several method and/or devices, which can be used to conduct geophysical surveys.
1. Metal detectors;
2. Magnetometers;
3. Ground penetrating radar;
4. Low frequency electromagnetics; and
5. Electric resistivity.

D. Selection

Before a geophysical survey can begin it is necessary to determine what the objectives of the survey are (i.e. depth, number, or boundaries of drums). Once the objective is determined the most effective device can be decided upon by evaluating the advantages and disadvantages of each device. Those advantages and disadvantages are as follows:

Revision 1 3 5/2001

1. Metal Detector - Advantages
a. widely available
b. light weight
c. can be used in and around vegetation
d. data can be interpreted in the field
2. Metal Detector - Disadvantages
a. low sensitivity which results in limited depth detection (4-5 feet)
b. not suitable for use on nonmetallic objects
c. interference received by metallic objects in area (i.e. pipes, chain link fences)
d. limited to station to station measurements
3. Magnetometers - Advantages
a. more sensitivity, resulting in greater depth detection (10-12 feet)
b. can approximate boundaries of buried drums
c. data can be interpreted in the field
d. no interference from metallic objects in the area (i.e. pipes, chain link fences)
4. Magnetometers - Disadvantages
a. limited to station to station measurements
5. Ground Penetrating Radar - Advantages
a. can detect plastic drums
b. can detect soil contamination
c. provides depth of burial of drums
d. provides orientation of buried drums
e. continuous surveying capabilities
f. data can be interpreted in the field
g. hand held
6. Ground Penetrating Radar - Disadvantages
a. effected by metallic object in the area (i.e. pipes, chain link fences)
b. effected by presence of clay in the soil

Revision 1 4 5/2001

c. effected by high groundwater
d. limited use in vegetated areas
7. Low Frequency Electromagnetics - Advantages
a. detects material leaking from drums
b. can provide 3-D imaging
c. more sensitivity results in greater depth detection (15-20 feet)
8. Low Frequency Electromagnetics - Disadvantages
a. can not always distinguish between drums and uncontainerized material
b. effected by metallic objects in the area (i.e. pipes, chain link fence)
c. requires computer processing to interpret data

9. Electrical Resistivity - Advantages
a. detects material leaking from drums
b. lightweight and portable
c. can determine changes in contamination with depth
10. Electrical Resistivity - Disadvantages
a. slow and costly
b. effected by metallic objects in the area (i.e. pipes, chain link fence)
c. data is hard to interpret
SOURCES AND AVAILABILITY OF THESE DEVICES MAY BE LIMITED, AND SHOULD BE CONFIRMED PRIOR TO INITIATING WORK.
3.4. Visible Containers
3.4.1. Inspection Items
The following items should be noted for readily visible containers:
A. Symbols, words, labels, or other markings, which may indicate contents (i.e. hazardous waste, corrosive, flammable, radioactive, explosive);
B. Signs of deterioration (i.e. corrosion, rust, leaks);
C. Signs of pressure build -up (i.e. swelling, bulging);
D. Drum type (i.e. steel, plastic, steel with a poly-liner);

E. Type of drumhead (i.e. bung, open top, bung with a liner);
F. Approximate number and location of drums (i.e. buried, partially buried, stacked, upright, overturned);
G. Immediate area around the drums (i.e. stains, dead animals or vegetation);
H. Types of product, which may be visible in or on the drums (i.e. solid, liquid, semisolid).
3.4.2. Special Drum Type:
A. Polyethylene or PVC-Lined Drums
Often contain strong acids or bases. If the lining is punctured, the substance usually quickly corrodes the steel, resulting in a significant leak or spill. This corrosion can also produce flammable/explosive vapors.
B. Exotic Metal Drums (e.g., aluminum, nickel, stainless steel, or other unusual metal)
Very expensive drums that usually contain an extremely dangerous material.
C. Single-Walled Drums Used as a Pressure Vessel
These drums have fittings for both product filling and placement of an inert gas, such as nitrogen. May contain reactive, flammable, or explosive substances.
3.4.3. Laboratory Packs
A. Used for disposal of expired chemicals and process samples from university laboratories, hospitals, and similar institutions in relatively small individual container sizes (< 5 gallons). Individual containers within the lab pack are often not packed in absorbent material. They may contain incompatible materials, radioisotopes, shock-sensitive, highly volatile, highly corrosive, or very toxic exotic chemicals. Laboratory packs can be an ignition source for fires at hazardous waste sites.
B. Drumhead Configuration
1. Whole Lid Removable
Designed to contain solid material.
2. Has a Bung
Designed to contain a liquid.
3. Contains a Liner
May contain a highly corrosive or otherwise hazardous material.
C. At no time during the inspection should there be any attempt to open the container for internal inspection or move the container to acquire a better vantage of sight.

3.4.4. Monitoring

A. To further characterize the container it may be necessary to perform non-invasive monitoring. Monitoring for the following should be considered.
1. Combustible Gas
2. Radiation survey (Gamma)
3. Organic Vapor (Photoionization or Flame Ionization Meter)
4. Colorimetric Detector Tubes
3.5. Classifying Containers
3.5.1. Once the site and container have been inspected, it will be necessary to classify the conditions and hazard. The following should be used to classify containers:
A. Radioactive;
B. Leaking/Deteriorated or unmovable due to potential for this to occur;
C. Bulging;
D. Explosive or shock sensitive;
E. Lab Pack; or
F. Unknown Contents.
3.5.2. Once the type of drum has been classified refer to appropriate section of this chapter to determine the method of handling.
3.6. Handling
3.6.1. Introduction
Due to the potential hazards associated with handling containers that contain hazardous materials, it is very important that handling and contact be properly planned and safety precautions thoroughly integrated into each operation. It may be is necessary to handle container for several reasons. These include:
A. Decrease hazard potential of the storage i.e. leaking, incompatible materials, stored together;
B. Prepare for sampling;
C. Stage for further characterization; or
D. Stage for ultimate disposal, consolidation, shipment, etc.
3.6.2. Hazard Communication
Once an action plan is determined it will be necessary to discuss with the crew the hazards of handling the containers. As each situation will differ, hazard communication will vary from site-to-site. However, all information gathered to this point in the operation shall be discussed

with employees prior to proceeding further. Additionally, the following must also be discussed:
A. MSDS of any known materials;
B. Classification of containers;
C. Monitoring results;
D. Continued site activity;
E. Information contained in the Site Specific Health and Safety Plan C;
F. Other information, which becomes available.
This action shall be documented and maintained on file at the site.
3.6.3. Handling Minimization
If it is determined that handling is necessary, steps must be taken to assure this is done in the most efficient and safest manner possible. An action plan should be established to plan the operation to minimize the handling. This is done by assessing first whether any work on the containers can be done in place. If not, or when handling the containers for a purpose specified above, appropriate parts of this section shall be reviewed and implemented. These include:
A. Spill containment - Materials, spill containment procedures (Section 3.7);
B. Transfer, overpack and patching procedures (Section 3.8);
C. Excavation procedure (Section 3.10);

D. Opening drums and containers (Section 6.0);
E. Material handling equipment (Section 3.11);
F. Static electricity (Section 3.12);
G. Ventilation (Section 3.8) ;
H. Fire extinguishing equipment (Section 3.13).
3.6.4. Handling Safety Programs
Once handling is deemed to be necessary and preliminary procedures/programs specified above have been reviewed and implemented, it will be necessary to review and implement one or several Handling Safety Program(s). These fall into the following categories (references indicate sections of this guideline).
A. Unlabeled/unknown containers (Section 4.0);
B. Staging (Section 5.0);
C. Opening Drums and Containers (Section 6.0);
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D. Sampling Drums and containers (Section 10.0);
E. Radioactive waste (Section 7.0);
F. Shock sensitive waste (Section 8.0);
G. Lab waste packs (Section 9.0);
H. Bulking (Section 11.4);
I. Shipment and transport (Section 11.0);
J. Tank and vault entry (Section 12.0).
3.6.5. Safe Handling Work Practices
The following safe work practices shall be implemented to minimize hazards associated with container/drum handling:
A. Utilize proper lifting techniques at all times. Always attempt to use mechanical assistance means (drum carts, forklifts, etc.);
B. Assure materials are lifted or moved with power of legs and not the back;
C. Assure vehicles have appropriate classification, rating and capacity to handle anticipated loads;
D. Assure road surface is devoid of ruts, crevices holes, etc. to provide smooth operation and prevent jarring, etc;
E. Availability of blast or splash shield where necessary and/or appropriate;
F. Have all anticipated material, equipment, personnel available prior to initiating any activity to minimize false starts;
G. Determine the most efficient sequence of action; and
H. Use only nonsparking tools while handling flammable materials.
3.7. Spill Containment
3.7.1. Equipment
Materials must be available on-site for use in the event of a spill, leak, or rupture during the operation. These materials should include, but not limited to, the following:
A. DOT approved salvage drums;
B. DOT approved 17H open top drums;
C. Sorbent pads;
D. Sorbent boom; and
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E. "Speedi-dri" or other absorbent material.
3.7.2. Work Practices
In the event that a release of hazardous materials occurs, the following actions will be necessary to control and contain the release and protect the health and well-being of employees and the public.
A. Notify on-site Supervisor.
B. Evaluate the spill from a safe distance.

C. Keep unnecessary people away from the release.
D. Isolate the area and deny entry.
E. Determine the appropriate level of protection. Base decision on air monitoring results and hazard assessment procedures. Review with Health and Safety personnel. (Refer to the SSH&SP or CHES Personal Protective Equipment Guidelines).
F. Eliminate all ignition sources in the area but do not turn any electrical equipment on or off. This could create an ignition source.
G. Keep all personnel upwind of the release.
H. Keep flammable and combustible materials away form the area.
I. Monitor the area for flammable and toxic vapors.
J. Classify the material or refer to characterization procedures.
K. Use only nonsparking tools to handle flammable materials.
3.7.3. Containment Techniques
The following spill containment and/or clean up techniques shall be followed if a release of hazardous waste materials occurs.
A. Small Solid/Dry Material Spill
1. Shovel the spilled material and any other material which it has contaminated into an appropriate approved drum.
2. Cover and seal the drum.
3. Label the drum as to its contents.
B. Small Liquid Material Spill Onto Land
1. Absorb the material with an appropriate absorbent material.
2. Shovel the contaminated material and any other material, which it has contaminated into an appropriate approved drum.

3. Cover and seal drum.
4. Label the drum as to its contents.
C. Large Liquid Material Spill Onto Land
1. Contain the material by creating a dike around the liquid.
2. Pump the liquid into a vacuum truck. Ensure that truck construction is compatible with spilled material (e.g. sulfuric acid/carbon steel).
3. Absorb any small pools of the spilled material with an appropriate absorbent material.
4. Shovel the contaminated material and any other material which it has contaminated into and appropriate approved drum.
5. Cover and seal drum.
6. Label the drum as to its contents.
D. Small or Large Material Spills Into Waterways
1. Contain the material with containment and/or absorbent boom.
2. Pump the material into a vacuum truck (again ensure compatibility with truck) and/or absorb the material with absorbent material.
3. Place the absorbent material into an appropriate approved drum.
4. Cover and seal the drum.
5. Label the drum as to its contents.
3.7.4. Protective Equipment
During all phases of spill containment and clean up, the appropriate levels of personnel protection shall be worn as determined in CHES PPE Guidelines.
3.8. Transfer, Overpack, And Patching Procedures
3.8.1. Introduction
Any drum that can not be moved without the threat of leaking, spilling, and/or rupturing shall be either patched, over packed or its contents transferred into a suitably sound container.
3.8.2. Transfer

A. Transferring - Introduction
Transferring or pumping, liquid material from one drum to another may be necessary in some situations. If so, there are several pieces of equipment, which can be utilized to accomplish this task.
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1. Electric transfer pump
2. Electric barrel pump
3. Air driven double diaphragm pump
4. Plastic "zep" hand pump
NOTE: Preview Section 3.12 Static Electricity, prior to initiating any transfer procedures.
B. Electric Transfer Pump
When an electric transfer pump is utilized, the following procedures shall be followed:
1. Place the pump on a solid level surface;
2. Ground the pump and then bond the pump to the container(s);
3. Insert the discharge hose into the drum receiving the material;
4. Remove the bung of the drum being pumped;
5. Insert the suction hose into the drum being pumped; and
6. Turn the pump on.
C. Ventilation
When pumping off drums containing toxic, flammable, or combustible liquids, an air driven or hydraulic powered fan might be needed (i.e. coppus blower) to prevent the build-up of flammable vapors. The fan should be placed on the upwind side of the drum and positioned such that the flow of air will disperse any vapors emitted from the drum and carry them away from the work zone. If a blower is to be used it shall be properly bonded and grounded.
D. Electric Barrel Pump
The pump must be intrinsically safe or explosion proof. When an electric barrel pump is used, the following procedures shall be followed:
1. Ground the pump and bond the pump to all containers;
2. Insert the discharge hose into the drum receiving the material;
3. Remove the bung of the drum being pumped;
4. Place the barrel pump into the drum being pumped; and
5. Turn the pump on.
E. Air Driven Double Diaphragm Pump
When an air driven double diaphragm pump is used, the following procedures shall be followed:
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1. Place the pump on a solid level surface;
2. Ground the pump and bond the pump to the container (s);
3. Connect the air hose to the pump;
4. Insert the discharge hose into the drum receiving the material;
5. Remove the bung of the drum being pumped;
6. Insert the suction hose into the drum being pumped; and
7. Turn the pump on.
F. Plastic "ZEP" Hand Pump
When a plastic "zep" hand pump is used, the following procedures shall be followed:
1. Ground and bond all containers;
2. Insert the discharge hose into the drum receiving the material;
3. Remove the bung of the drum being pumped;
4. Insert the suction hose into the drum being pumped; and
5. Begin pumping.

3.8.3. Overpacking
A. Introduction
1. There are several methods, which can be used to overpack drums. Choosing the appropriate one will depend on the accessibility to the leaking drum. The methods are as follows:
a. Using a machine, such as a forklift, backhoe, or bobcat to lift the leaking drum and lower it into the overpack.
b. Rolling the leaking drum into the overpack on the ground at an angle.
2. All attempts should be made to overpack the leaking drum so that it remains in an up-right position. By doing this it will allow for easier sampling of the leaking drum.
3. Overpacking consists of placing a drum, which cannot be moved without the threat of leaking, spilling, and/or rupturing into a larger container so that it contains and secures the leaking container.
4. Be sure to record all available label information from the drum before overpacking as it will not be visible once overpacking occurs.

B. Preparation
Before overpacking may begin consideration must be given to the compatibility of the overpack drum with the material in the drum that is to be overpacked. The following test shall be conducted to determine what type of overpack to use.
C. Testing for pH
1. The pH of the material to be overpack shall be tested using litmus paper to determine if the material is one of the following.
Acid pH from 1 to 5
Neutral pH from 6 to 8
Base pH from 9 to 13
2. After it has been determined what the pH of the material is, the selection of the correct type of overpack to be used can take place. Selection is as follows.
Acid poly overpack to be used
Neutral steel overpack to be used
Base poly overpack to be used
3. Once the selection of the overpack to be used is completed, overpacking procedures may begin.
D. Using Mechanical Equipment
1. Lift the drum up using a fork-lift, bobcat, or backhoe with either a drum sling or drum grappler;
2. Slowly lower the drum into the overpack;
3. Seal the overpack by placing a gasket then cover and ring in place; and
4. Secure.
E. Inverted Method
1. Place the overpack over the drum in question so that the overpack is upside down;
2. Both drums are simultaneously flipped over so that the overpack is now right side up and the drum in question is upside down inside the overpack; and
3. The gasket, cover, and ring of the overpack are securely sealed; or
4. Placing an overpack onto the leaking container.
3.9. Overpacking Vs. Transferring
3.9.1. Selection
Selection of the appropriate method to be used, overpacking or transferring, will depend on the evaluation of a number of questions. These include:

A. Accessibility of the drum by both personnel and equipment:
1. drum off the road 200 yards – overpack;

2. drum on a loading dock - overpack or transfer.
B. The number of drums to be handled:
1. few - overpack or transfer;
2. hundreds – overpack.
C. The type of operation being conducted:
1. emergency response to one leaking drum at a factory - overpack or transfer;
2. the excavation of several hundred drums at a superfund site – overpack.
D. The size of the drums:
1. 55-gallon - overpack or transfer;
2. 5-gallon pail – overpack.
E. Are the drums to be stored in their present state for future evidence? – overpacking.
F. The availability of the equipment needed to complete the job.
G. The physical state of the drums:
1. good condition - overpack or transfer;
2. bad condition – transfer.
H. Are the contents of the drum known or unknown:
1. known – transfer;
2. unknown – overpack.
I. Is the material in the drum to be disposed of or is it to be saved for future use:
1. save – transfer;
2. dispose – overpack.
J. The physical state of the drums material, solid or liquid:
1. solids – overpack;
2. liquids – transfer.
K. Only after these and/or other questions and/or concerns are answered and/or addressed can the choice be made between overpacking or transferring of the drum's contents be made.

3.9.2. Plugging and/or Patching
Plugging and/or patching a leaking container can be done using a number of methods. The selection of the best method will depend on the size and shape of the leak.
A. Small Punctures
One of the following techniques can be used to plug and/or patch a small puncture:
1. Rubber/ball, toggle bolt with washer and wing nut;
The toggle bolt is inserted into the puncture and the wing nut is tightened to compress the rubber/ball on the opening.
2. Soft wooden plug with felt padding;
The felt padding is wedged into the puncture and secured in place with the plug.
3. Self tapping screw with washer and/or gasket;
The screw is inserted into the puncture and tightened to compress the washer and/or gasket on the opening. See figure3.
4. Chemical patch;
Combining of two (2) base products to create a compound, which will seal the puncture when it is applied to the opening.
NOTE: This technique is not recommended for patching pressure leaks.
5. Insoluble mastic and/or putty
The mastic and/or putty is applied onto and over the puncture.
NOTE: This technique is not recommended for patching pressure leaks.
B. Small Linear Cracks
The following technique shall be used to patch and/or plug a small linear crack:
1. Oakum, mastic, or cloth and a wedge;
2. The oakum, mastic, or cloth is wedged into the crack and secured in place using the

wedge.
C. Large Irregular Holes
One of the following techniques may be used to plug and/or patch a large irregular hole:
1. Chemical patch
Combining of two (2) base products to create a compound, which will seal the puncture when it is applied to the opening;
NOTE: This technique is not recommended for patching pressure leaks.
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2. Rubber/ball toggle bolt with washer and wing nut
The toggle bolt is inserted into the puncture and the wing nut is tightened to compress the rubber/ball on the opening;
3. T-Bolt and plate patch
The t-bolt is inserted into the hole and the wing nut is tightened to compress the plate patch on the opening;
4. Combination of various shaped wooden plugs with felt
The felt padding is wedged into the hole and secured in place with various shaped wooden plugs.
3.10. Excavation
3.10.1. Introduction
In certain situations it may be necessary to uncover buried drums or containers. This aspect of the handling operation is particularly dangerous because of the potential for contact, puncturing, etc. during the operation. Therefore, these procedures and others applicable from this section should be used as guidance.
3.10.2. Locating Buried Drums or Containers
Prior to beginning excavation or unearthing any buried drums or containers a ground penetrating or detection method shall be utilized to determine and estimate the location, depth, and boundaries of the buried drums or containers. See Section 3.0.
3.10.3. Drum Excavation Procedures
After determining the location of the buried drums or containers, excavation procedures will begin. These procedures will include the following steps:
A. Excavate to the top of the buried drums;
B. Hand excavate the remaining soil away from around the drums;
C. Inspect and characterize the containers as far as possible. Apply appropriate safe handling and work practices, outlined in Section 3.6 prior to proceeding. Also, review Section 3.4.
D. Determine if overpacking or transferring of the drum and/or its contents will be required. Review Section 3.9
E. If the drums have been determined to be sound, they shall be removed from the excavation. This shall be done using either a drum grappler or drum sling. (See Section 3.11).
F. Once the drum has been removed from the ground it shall be immediately placed or brought to the first staging area. (See section 5.0).
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3.10.4. Opening and Leaking Containers - Precautions
Under no circumstances shall any drum be opened in the excavation area. This shall only be done in the staging area using the appropriate procedures. If, however, a drum is leaking when it is removed from the excavation it shall be, transferred, patched, or overpacked immediately.
3.10.5. Contaminated Soil
During the excavating process, all contaminated soil should be transferred to a temporary storage area. The soil should be stockpiled on polyethylene until it can be disposed of properly in accordance with state and federal regulations.

3.10.6. If excavation of drums or containers progresses more than four (4) feet into the earth, CHES Excavation Guidelines must be followed.
3.11. Material Handling Equipment
3.11.1. There are many different pieces of equipment available for properly handling and transferring products from drums. Below is a list of the various pieces and their uses:
Bobcat and drumgrabber Moving drums
Drum dolly Moving drums
Diaphragm pump Transferring product
Piston type hand pump Transferring product
Plastic type siphon hand pump Transferring product
Drum probe Transferring product
Electric chemical pump Transferring product
Bung wrench (brass) Opening drums
Grounding and bonding straps Grounding and bonding drums and containers
NOTE: An electricity driven pump must not be used when dealing with flammable and combustible liquids, unless it is intrinsically safe or explosion proof.
3.11.2. Equipment compatibility
Care should be taken to assure that the equipment used to perform the transfer is compatible with the material in the drum, and will not cause a reaction. If the content of the drum is unknown, samples must first be obtained and analyzed prior to transferring the product.
3.12. Static Electricity
3.12.1. Introduction
During the transfers (free flow of fluids) of a liquid, static electricity is always generated. Typically this is only a problem when handling flammable materials. However, due to the potential for mislabeled containers, cross-contamination, etc., and the likely result, this hazard shall always be controlled when transferring liquids. Bonding and grounding of the container is the method used to control static electricity. All personnel should be familiar with CHES Grounding and Bonding Guidelines, in addition to the material in this section.

3.12.2. Grounding and Bonding - Background
A. Bonding is the process of connecting two or more conductive objects together by means of a conductor.
B. Grounding is the process of connecting one or more conductive objects to the ground and is a specific form of bonding.
C. Some objects are inherently bonded or grounded by the fact that they are in contact with the ground. Such is the case with underground storage tanks. However, other situations such as drums in contact with the soil are not sufficient to assure grounding. Therefore, it will be necessary to drive a ground. Bonding minimizes potential differences between conductive objects. Grounding minimizes potential differences between objects and the earth.
3.12.3. Method
A. Grounding
1. To obtain a deliberate ground, it will be necessary to attach to an existing ground or drive a low resistance (e.g. copper) rod into the soil to a sufficient depth (minimum 3 ft., as specified in CHES Grounding and Bonding Guidelines).
2. Contact Health and Safety for further direction. A bonding cable from the ground to the containers will be needed for grounding purposes. All connections shall be attached to clean, non-corroded, unpainted surfaces of the containers. If one does not exist, it may be created with the use of emery cloth or sand paper. Be aware of friction hazard.
B. Bonding
Cables, wire, etc. must be connected between containers where liquid is transferred.

There must be a minimum of one bond wire between any two containers involved in a transfer (and one wire to ground.) The cable shall be connected to a clean, non-corroded, unpainted surface of the containers. If one does not exist, it may be created with the use of emery cloth or sand paper. Be aware of friction hazard.

3.13. Fire Extinguishing Equipment

Fire extinguishing equipment must be made available on-site. The equipment will consist of at least two (2) 20 lb. multi-purpose dry chemical extinguishers for every 50 feet of travel distance. They shall be available in areas where work is being performed. Extinguishers agents for combustible metal fires must also be available on the job site if this material is handled.

4. UNIDENTIFIED CONTAINERS

4.1. General Information

4.1.1. Due to the inability to identify the hazards of unlabeled containers, additional safety measures must be employed when such containers are located or anticipated. A thorough inspection must be conducted in order to properly classify the contents. Unlabeled containers shall be considered unknowns and anticipated to contain the most extreme hazards until they are classified. Information described in Section 3.4 should be used to evaluate the container contents.

4.1.2. Assessment shall be made from a distance using binoculars and other techniques. Information specified in 3.4 shall be used to determine if the unlabeled containers can be approached for further evaluation, characterization, and possible movement. This decision shall only be made by the on-site Project Manager/Supervisor in conjunction with Health and Safety Personnel.

4.2. Assessment Sequence

4.2.1. The assessment of unlabeled containers shall be made using a hierarchy of hazard model. The Project Manager and Health and Safety personnel shall characterize the drums using the decision-making process specified in these guidelines.

4.2.2. If the unlabeled containers can be classified into one of the other categories listed in Section 3.6, then refer to the appropriate section of these guidelines. If, in the judgment of onsite supervision (in conjunction with Health and Safety) the containers cannot be characterized, it may be necessary to employ additional safety measures to identify the contents. This will only be done with the concurrence of top-level company officials. Contact the Branch Manager, Regional Vice President and Manager-Occupational Health and Safety.

4.3. Handling Precautions

4.3.1. If sufficient information is available to characterize the contents of unlabeled containers, the containers may be approached to perform the appropriate activity. However, the following precaution will be discussed with all employees involved and will be strictly followed.

A. Container Reaction

If at any time during the handling process any drum or container begins to react, all drum handling procedures shall be left undisturbed for a period of no less than 24 hours. If at the end of this time period the reaction has stopped or is completed may the drum may again be considered for handling.

B. Transporting Unknowns

The transporting of unknown drums shall be done using the appropriate material handling equipment outlined in Section 3.11 of this document.

5. STAGING

When large numbers of drums are handled it is necessary to develop and implement a staging system to organize and minimize the handling.

5.1. Staging Areas

Staging locations should be divided into the following:

5.1.1. First Staging Area - Used as a temporary storage in preparation for sampling. Drums are brought here from the original excavation or dumpsite. Drums are organized into type, size,

and suspected contents;
5.1.2. Drum Opening and Sampling Area - Area where individual (single) drums are brought to be opened and sampled;
5.1.3. Second Staging Area (Holding Area) - Used as a temporary storage area after sampling analysis is complete. Pending Characterization;
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5.1.4. Final Staging/Bulking Area - Area where drums are brought, after they have been characterized, to be either shipped individually or bulked for disposal. In this final staging area, drums pending shipment for disposal shall be segregated in groups according to their chemical characterization (i.e. flammable liquids, acids, PCB's, etc.) for bulking see section 10.4.
5.2. Staging Area Design
Each staging area shall be constructed in the following manner:
5.2.1. Grade the area as level as possible;
5.2.2. Cover the area with a layer of impervious plastic sheeting;
5.2.3. Construct a one foot high dike wall around the staging area; and
5.2.4. Construct ramps over the dike to allow for entry and exit into the staging area.
5.3. Drum Arrangement
5.3.1. In any staging area where more than one drum is stored, the drums shall be arranged in the following manners.
A. Drums shall be arranged in rows of two (2); and
B. Space the rows 8-10 feet apart to all for access.
5.3.2. The final staging area should be located as close as possible to the site exit. The whole staging area should be covered with poly sheeting and have a dike wall of at least one foot high surrounding it. Ramps shall be constructed over the dike for use as routes of entry and exit.
5.3.3. All drums located in the final staging area should be segregated according to hazard class (flammable, corrosive, etc.). All areas of staged drums should be just two drums wide with only two rows per area. Each hazard class area should be separated by a minimum of at eight to ten feet.

6. OPENING DRUMS AND CONTAINERS

6.1. Introduction
A closed container of hazardous material, whether it is a 5-gallon pail or a 10,000-gallon tank, can pose a major threat to the person who is opening that container. Because of the possible hazards involved in the opening of drums, specific precautions shall be taken to protect the personnel opening the container, the personnel in the immediate area and the equipment in the area.
6.2. Purpose
6.2.1. Hazards associated with the opening of hazardous waste containers include, but are not limited to:
A. The release of toxic and/or flammable gases and vapors;
B. Explosions;
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C. Spills;
D. Exposure to the contents beyond TLV levels; and
E. Mechanical injuries to the hands, back, etc.
6.2.2. The following procedures should be used to reduce or eliminate the hazards associated with opening drums and containers.
NOTE: Before opening procedures commence, drums shall be staged in order that all drums can be reached. (See section 3.0 of this document.) At no time shall drums be walked over or stood upon to reach other drums.
6.3. Protection Of Personnel Involved In Opening Procedures
6.3.1. Employees Right To Know/Hazard Communication

Refer to Section 3.6.2. of this document.
6.3.2. Personal Protective Equipment
Refer to SSHP and CHES PPE Guidelines.
6.3.3. Protection From Pressurized Drums And Containers
A. Containers that are believed to be under pressure, including evidence of bulging, shall be handled with extreme caution. Remote equipment shall be used to open the pressurized containers. Review and follow CHES Remote Handling Guidelines.
B. The purpose of this section is to make employees aware of the hazards of handling pressurized drums and procedures for handling those drums. Again, refer to CHES Remote Handling Guidelines for safety procedures. Pressurized drums present a variety of hazards including fire, explosion and toxic vapor release.
C. In the event that a pressurized drum is encountered, the following steps shall be initially taken.
1. The pressurized drum shall not be moved
2. Isolate the area
3. Keep unnecessary people away from the area
4. Notify the on-site supervisor immediately
6.3.4. Ignition Protection For Opening Hazardous Materials Containers
Non-sparking equipment, including hand tools, shall be used for any opening procedure. During all opening procedures, all potential ignition sources shall be eliminated within 100 feet of the operation.

6.4. Protection Of Personnel In Adjacent Areas
6.4.1. Employees that are not actually involved in the opening process shall be required to be situated in the support zone. All opening procedures shall be performed within the exclusion zone.
6.4.2. If employees must work adjacent to the staging area where container opening is taking place, an explosion-proof barrier must be constructed/placed between the containers and the employees. Staging areas should be placed in remote areas to limit this from occurring. Both the staging area and the explosion barrier should be discussed in the Site Health and Safety Plan. (Refer to section - Site Control).

7. RADIOACTIVE WASTES

7.1. Introduction
Clean Harbors Inc. has in effect strict guidelines regulating radioactive material. Clean Harbors will typically not accept any radioactive materials or waste into any of the inter-company facilities. Because other facilities have similar restrictions and because of the need to ensure personnel are properly protected, potential handling of radioactive materials must not be done unless Environmental Compliance, Health and Safety, and Regional Operations VP approval is provided.
7.2. Purpose
The purpose of the following procedures is to protect the health and safety of the employees of Clean Harbors.
7.3. Determining The Presence Of Radioactive Material
Properly calibrated meters shall be available for the assessment of radioactive materials. These instruments include Geiger Counters with various probes.
7.4. What To Do If Radioactivity Is Discovered
7.4.1. If readings are encountered which are three (3) times above normal background readings for that area, all personnel will evacuate the area immediately and contact on-site management personnel and Health and Safety. Appropriate response procedures will be developed by Health and Safety, Compliance, and Operations personnel.
7.4.2. Normal background readings shall be considered to be the average reading which is found in areas at least 100 yards outside and upwind of the support zone.

8. SHOCK SENSITIVE WASTES

8.1. Purpose

The purpose of this section is to outline and provide Clean Harbors Inc. employees with guidance in the event that they encounter or suspect the presence of shock sensitive wastes during hazardous waste site operations and emergency responses.

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8.2. Recognizing Shock Sensitive Materials

Materials shall be considered shock sensitive if any crystalline materials are noted on any of the drums or containers; the drums or containers are pressurized, the drums and container appear to contain lab pack material, or any written marking indicate shock sensitive material.

8.3. Evacuation of Nonessential Personnel

If drums of shock sensitive waste are encountered or their presence suspected the following initial procedures will be followed:

8.3.1. All work activities on the job site shall stop.

8.3.2. All nonessential personnel will be evacuated from the job site to a safe distance.

8.3.3. The onsite site safety officer will be notified of the discovery.

8.3.4. Notify the Regional Health and Safety Manager immediately.

8.3.5. Handling procedures will be determined only after an adequate evaluation of the situation has been performed, including consultation with CHES High Hazard Group.

8.4. Use of Personal Alarm Systems

Prior to the commencement of handling waste, which is considered shock sensitive, an audible siren signal system shall be sounded. This signal must be louder than the noise conditions in and around the job site. The same audible siren signal shall be sounded at the completion of the handling operations. Additionally, it may be necessary to use a visible strobing yellow light throughout the duration of the handling operations to indicate that operations are being conducted. This will be determined by on-site supervisor. This must be communicated to all personnel during site training.

8.5. Communications

During handling operations involving shock sensitive waste, a continuous line of communications shall be maintained. The communication shall be between the foreman in charge of the handling operation and the command post. The site supervisor and site safety officer shall both be present at the command post at this time. The type of communications system that will be used will depend on each situation. It is required, however, that the system to be used be intrinsically safe or explosion proof.

8.6. Handling Drums Under Pressure

If drums or containers are encountered which appear to be under pressure refer to Section 6.0 of this document.

9. LABORATORY WASTE PACKS

Contact CHESI Lab Pack support personnel for additional guidance in identifying or handling Lab Packs.

9.1. Purpose

This section will outline and provide Clean Harbors Inc. employees with guidance in the event that laboratory waste packs are encountered or suspected during hazardous waste site operations or emergency responses.

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9.2. Recognizing Laboratory Waste Packs

Laboratory waste packs shall be defined as any drum or container, which contains or is suspected to contain individual containers of laboratory materials. This material is normally surrounded by cushioning absorbent material. These individual containers can range in size from one (1) ounce to five (5) gallons.

9.3. Evacuation Of Nonessential Personal

If drums of laboratory waste packs are encountered or their presence suspected the following initial procedures will be followed:

9.3.1. All work activities on the job site shall stop.

9.3.2. All non-essential personnel will be evacuated from the job site to a safe distance.
9.3.3. The onsite site safety officer will be notified of the discovery.
9.3.4. Notify the Regional Health and Safety Manager immediately.
9.3.5. Handling procedures will be determined only after an adequate evaluation of the situation has been performed.
9.4. Use Of Personal Alarm Systems
Prior to the commencement of handling laboratory waste packs, an audible siren signal system shall be sounded. This signal must be louder than the noise conditions in and around the job site. The same siren signal shall be sounded at the completion of the handling operations. Additionally, it may be necessary to use a visible strobing yellow light throughout the duration of the handling operations to indicate that operations are being conducted. This will be determined by on-sire supervision. This must be communicated to all personnel during Site training.
9.5. Communications
During handling operations involving laboratory waste packs a continuous line of communications shall be maintained. The communication shall be between the foreman in charge of the handling operation and the command post. The site supervisor and the site safety officer shall both be present at the command post at this time. The type of communications system that will be used will depend on each situation. It is required, however, that the system to be used be intrinsically safe or explosion proof.
9.6. Handling Drums Under Pressure
If drums or containers are encountered which appear to be under pressure, refer to Section 6.0 of this document.
9.7. Handling Crystallized Materials
If crystalline materials are noted on any drum or container, the contents of that drum or container shall be considered to be shock sensitive and handled as such until the contents have been properly identified. Refer to Section 8.0 of this document.

10. SAMPLING DRUMS AND CONTAINERS

10.1. Purpose
10.1.1. This section will outline procedures to perform drum sampling of unknown or known material during hazardous waste sit operations or emergency responses.
10.1.2. Ensure that personnel are familiar with all Drum Handling Guidelines before proceeding.
10.2. Personal Protection Of Employees
10.2.1. During all phases of unknown material drum sampling, employees involved in the procedures will be required to wear level A protection. If, however, background information of the job site (i.e. history) and the drums contents are available, level B protection may be substituted for level A. (Refer to Personal Protective Equipment Guidelines for a description of level A and B protection).
10.2.2. PPE Selection and use for any drum or container project shall be based on site and hazard assessment. The Project Manager in conjunction with Health and Safety is responsible for proper PPE selection. Specific PPE shall be specified in the SSHSP.
10.3. Sampling Procedures
10.3.1. Liquid Material Drum Sampling Procedures
A. Don PPE;
B. Remove the bung, using non-sparking bung wrench, from the sample container/drum. If any pressurization is noted, stop, back off, and notify on-site Safety and supervisory personnel.
C. Once bung is removed, utilize glass Coliwassi/glass thief to obtain sample, and place material into appropriate sample container.
D. Do not reuse sampling thief. Discard used thief in drum from which it was sampled, or in a separate container or drum. If glass thief must be broken to fit into waste drum,

perform breakage carefully to avoid glass lacerations.
E. Close bung and proceed to next drum.
10.3.2. Solid Material Drum Sampling Procedures
The following procedures will be followed when sampling unknown or known solid material from drums:
A. Remove the lid from the sample container and prepare the container for the sample material;
B. Open and remove the top from the drum;
C. Insert a trowel (explosion proof, if flammable solids are being sampled) into the solid material, doing so at an angle (it may required that the drum be tilted in order to reach and extract the sample);

D. Slowly remove the trowel and the material from the drum;
E. Transfer the material from the trowel into the sample container;
F. Repeat these steps if more material is needed to fill the sample container;
G. Close the lid of the sample container; and
H. Close the top of the drum.
10.4. Cross Contamination
10.4.1. Cross contamination of samples shall be avoided at all times. If cross contamination occurs, it will result in an unrepresentative sample of a particular drum or container. This in turn will result in an incorrect analysis result of that particular drum or container.
10.4.2. To avoid cross contamination of samples being taken, the following steps should be followed:
A. Do not use a sampling tube on more than one drum or container of liquid material. Properly discard the tube after use;
B. Thoroughly clean and decontaminate the solids sampling device before it is used to sample another drum or container.

11. SHIPPING AND TRANSPORT

11.1. Introduction
11.1.1. This section will cover the methods for properly identifying and labeling drums for disposal, the staging of drums, and the proper procedures for compatibility testing and bulking of drum contents.
11.1.2. When dealing with drums containing unknown materials, it is of great importance that all possible efforts are made to properly identify their contents. This will ensure that the drums will be shipped and disposed of in accordance with all local, state, and federal regulations.
11.2. Fingerprinting
11.2.1. If no information is available from the drums such as labels, product description, etc., field fingerprinting can be conducted on each drum so that staging and transport may be accomplished. The first staging area should be a separate area remote from the work zone. From the initial staging area the drums should be moved individually to the drum opening and sampling area, where fingerprinting will be conducted. See Section 5.0. Only one drum at a time should be located in the drum opening and sampling area. Fingerprinting procedures must follow the specific testing procedures established for the project. A sample of the material should be obtained at this time for further laboratory analysis.
11.2.2. Once fingerprinting of each drum is conducted, the drum should be labeled. Labeling of drums should be accomplished utilizing CHES guide.
11.3. Staging
11.3.1. After fingerprinting, sampling, and labeling are accomplished, the drums should be now moved to a second staging area to await placement into the final staging area. Once all drums are sampled and labeled, they should be placed in the final staging area.

11.3.2. The only time bulking of liquids can be done is after a full analysis of the container contents

has been completed and the results reviewed. The contents must be compatible. Review all planned bulking with Site Project Manager and Health and Safety. Approval from these personnel must be obtained. Follow procedures listed below in 11.4.1.

11.4. Bulking

11.4.1. Preparation

Bulking, or mixing and combining, of materials from individual drums into larger containers for both onsite storage and shipment for disposal shall only be performed after the following have been completed.

A. A more extensive chemical analysis, than that performed to characterize drum contents, has been performed by a certified laboratory.

B. The results of that analysis has been received and reviewed to determine which materials may be safely combined.

11.4.2. Inspection

Once the results of the analysis have been received and prior to the bulking of the materials the following areas of concerns shall be addressed.

A. Inspect and ensure that the container to receive the bulked material is clean and free of any residual material which may react with the pumped material.

B. Use only pumps and hoses that are compatible and approved for the material to be pumped.

C. Inspect and assure at all pumps and hoses to be used are free of leaks and deterioration and are in good working order.

11.4.3. Bulking Procedures

A. Bulking procedures shall be the same as those used for transferring material from drum to drum (See section 3.8) with the addition of the following.

B. A compatibility test shall be performed prior to the pumping of each drum. This test will involve the following.

1. A small quantity of each drum shall be mixed in a five gallon pail to observe for signs of incompatibility.

2. Signs of incompatibility would be:

a. heat generation

b. smoking

c. vapor generation

d. splashing

e. bubbling

3. If any of these signs are observed, all bulking procedures shall stop and Site Health and Safety and the Site Supervisor shall be notified to determine appropriate handling procedures.

12. TANK AND VAULT PROCEDURES

12.1. Introduction

Tanks and vaults present special hazards to all CHI workers who have to perform work in and around them. Entering a tank or vault to perform any type of work requires special precautions be taken to assure the safety of all involved. The many different aspects of entering and working in any confined space are covered in the Clean Harbors Confined Space Entry Program. These requirements should be followed by all CHI employees, so as to minimize the risks associated with the entry or work in confined spaces.

12.2. Tank and Vault Entry

The following procedures should be followed when dealing with tanks and vaults:

12.2.1. Follow all Confined Space Guidelines for initial hazard assessment and determination. If pressurization is suspected, contact Site supervisor and Safety personnel to determine appropriate procedures.

12.2.2. Mark and secure the area around the opening to prevent workers from falling into the tank opening.
12.2.3. If the material in the tank is unknown, a sample should be taken and sent for analysis prior to any entry. If the material is known and MSDS are available, work can begin following CSE Guidelines.

13. REFERENCES

National Fire Protection Association
Standard # 77
Recommended Practice on Static Electricity
1988
National Fire Protection Association
Fire Protection Handbook 16th Edition
1986
Environmental Protection Agency
Standard Operating Safety Guides Handbook
November 1984
Environmental Protection Agency
Sampling at Hazardous Materials Incidents Handbook
May 1984
Drum Handling Manual For Hazardous Waste Sites
Bryson, Furman, Hodge, Wagner, Wetzer, and Wickline
1987
Revision 1 29 5/2001
Occupational Safety And Health Guidance Manual For Hazardous Waste Site Activities
NIOSH, OSHA, USCG, EPA
October 1985

APPENDIX F

APPENDIX F

Quality Assurance/Quality Control Plan

APPENDIX F

QUALITY ASSURANCE PROJECT PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

DRAI Job Nos. 01C2084

prepared for

Edgewater Enterprises, L.L.C.
525 River Road
Edgewater, New Jersey 07020

prepared by

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Millburn, New Jersey 07041

May 16, 2003

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CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

_____ Date:
DRAI Project Manager
Peter L. Grogan

_____ Date:
DRAI Quality Assurance Manager
Robert J. Lippencott

_____ Date:
DRAI Field Manager
Jamie Barr

_____ Date:
USEPA Region II Project Manager
Name: Mr. Richard Ho

_____ Date:
USEPA Region II Quality Assurance Manager
Name:

_____ Date:
Laboratory Quality Assurance Manager
Integrated Analytical Laboratories, LLC.
Name:

APPENDIX F

QUALITY ASSURANCE PROJECT PLAN

CELOTEX INDUSTRIAL PARK EASEMENT
QUANTA RESOURCES SUPERFUND SITE
EDGEWATER, NEW JERSEY

1.0 PROJECT/TASK ORGANIZATION

Dan Raviv Associates, Inc. (DRAI) has been retained by Edgewater Enterprises, L.L.C. (Edgewater Enterprises) to prepare this QA/QC Plan [a.k.a. Quality Assurance Project Plan (QAPP)] in support of the Sampling and Analysis Plan (S&A Plan) submitted as Appendix E, of the Roadway Easement Cap and Access Roadway Remedial Action Workplan (Workplan) at the Quanta Resources Superfund Site (Quanta) in Edgewater, New Jersey. The field work will be conducted under the direction of DRAI including sample collection and field analyses. Samples collected for soil sampling and waste disposal parameters will be analyzed by Integrated Analytical Laboratories, LLC of Randolf, New Jersey. The scope of work addressed by this QAPP is described in the S&A Plan prepared by DRAI, as part of the Workplan This QAPP was prepared as required by the United States Environmental Protection Agency (USEPA) as stated in the Administrative Order on Consent (Order), signed by Edgewater Enterprises, LLC and The USEPA on March 21, 2003.

In order to ensure successful implementation of the project, a concise organizational structure has been developed. Key roles include the following:

DRAI PROJECT MANAGER will be the main contact for the project and will be responsible for ensuring that the project is being implemented in accordance with the USEPA- approved work plans and this QAPP. The DRAI Project Manager will be the focal point for contact with the USEPA Project Manager, the DRAI Field Manager, the DRAI Quality Assurance (QA) Manager, and where appropriate, the Laboratory Manager and/or the Laboratory QA Manager.

DRAI QA MANAGER will ensure that all elements of this QAPP are followed. Where QA or Quality Control (QC) issues arise, the DRAI QA Manager will be contacted by the Field Manager or Laboratory QA manager, depending on the nature of the issue, for guidance and resolution. The DRAI QA Manager will report directly to the DRAI Senior Project Manager.

DRAI FIELD MANAGER will be responsible for overseeing field activities on a day-to-day basis. He will ensure that all field-work is conducted in accordance with the approved work plans and this QAPP. Should potential issues arise, he will contact the DRAI QA Manager, Laboratory QA Manager or DRAI Senior Project Manager, as appropriate.

LABORATORY MANAGER has the responsibility of ensuring that the laboratory follows the laboratory QAPP and all laboratory standard operating procedures (SOPs). In addition, the Laboratory Manager will sign off on all of the data packages to further document that all Laboratory

quality assurance program (QAP) and SOP procedures have been followed and that the data are legally defensible.

LABORATORY QA MANAGER will be required to ensure that laboratory staff follow the Laboratory QAP and SOP requirements and are properly trained. Where technical project QA/QC issues arise, the Laboratory QA Manager must advise the Laboratory Manager, DRAI QA Manager and/or the DRAI Field Manager as appropriate.

2.0 BACKGROUND

Pursuant to the Order, a site inspection of the Easement and Inspection Area of the Quanta Site was conducted on April 17, 2003 and an Environmental Assessment Report was completed. The Environmental Assessment Report is being submitted to the USEPA with this document under a separate cover. A RAW was prepared in accordance with the Order that includes a S&A Plan (Appendix E).

This QAPP has been prepared by DRAI to define and support the sampling and analytical objectives of the S&A Plan. The QAPP was prepared in accordance with the USEPA, SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", June 1997, Final Update III. Included in this QAPP is a QA component that addresses overall management and control for both work plans. QC procedures relating to specific sampling, analysis, and data review issues are also defined. The overall objective of the QAPP is to ensure that appropriate QA/QC procedures are in place to meet the Data Quality Objectives (DQOs) of the work plan. The DQOs are defined in this QAPP and are based on the requirements of the S&A Plan.

3.0 PROJECT DESCRIPTION AND DATA USE

The Workplan includes clearing the Easement area of debris, structures, and any substances and construction of a geomembrane cap and roadway. The Environmental Assessment Report, completed per the Order, identified nine Areas of Environmental Concern (AOCs), eight of which require sampling and analysis for soil quality and waste disposal. A S&A Plan was prepared to address the sampling requirements.

This QAPP addresses the DQOs, organization and QA/QC procedures required for the S&A Plan.

3.1 Summary of Analytical Methods and Data Use

The S&A Plan includes the analysis of soil samples for Polychlorinated Bi-Phenyls (PCBs), Target Compound List/Target Analyte List (TCL/TAL), waste classification parameters following RCRA Characterization guidelines and Toxicity Characteristic Leachate Procedure (TCLP).

All proposed samples will be analyzed in accordance with USEPA's SW-846 Methods listed on Table I, except as noted on the table.

4.0 DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT

For soil samples, specific action levels are not applicable, since the samples are being collected to document the soil quality at each location prior to installation of the capping system. Upon implementation of the projects covered by this QAPP in order to appropriate action levels and remedial alternatives, waste classification data will be compared to the RCRA Characteristic and TCLP action levels identified in 40 CFR 261 for determination of proper waste disposal management.

Data Quality Objectives (DQOs) define the level of uncertainty for the results of analyses that will be acceptable to the end data user. DQOs can be project, sample and/or analyte-specific. For the purposes of this QAPP, in order to support the data collection and analytical requirements of the S&A Plan, DQOs have been defined on four levels.

Level I
Field Screening, using instruments such as a photo-ionization detector (PID), will be conducted as a standard field activity associated with soil sample collection. Results obtained from this type of instrumentation are not compound specific or quantitative. The objective of these data is for comparative purposes and will be used to select the appropriate depth of sample collection, typically within a given boring location. Sample collection for laboratory analysis will correspond to the depth where the highest PID reading, or other field instrumentation results, were obtained.

Level II
Field parameters such as pH, will be performed by Clean Harbors as part of the preparation of lab packs for disposal of containerized wastes. All such field analyses will be performed in accordance with Clean Harbors Drum Handling Guidelines (see Appendix B).

Level III
These data will be evaluated in terms of precision, accuracy and adherence to specific method criteria for the laboratory parameters listed in Table I. The laboratory will be required to provide a detailed "Conformance-Non Conformance Summary" with all data deliverables; an example is provided as Appendix A. Where any method or laboratory-defined QC criteria are not achieved, it must be documented in this summary. At a minimum, all of the laboratory-generated data will be evaluated at this level, including ground water VOC data from temporary wells and/or Geoprobe samples used to locate permanent monitoring wells and soil samples.

Level IV
Data deliverable packages for VOC analysis performed in a laboratory per the appropriate SW-846 methodology will contain all of the information required to perform a rigorous data validation. This includes all of the analytical information required by the USEPA Contract Laboratory Program (CLP); however, the data will not be submitted on CLP forms. The data deliverables are the same as required for the Level III DQOs. However, they will be subject to a vigorous, third-party data validation that will be conducted on 100% of the VOC data generated from laboratory VOC analysis of all soil samples and all ground water samples from monitoring wells.

5.0 SAMPLE COLLECTION

The sample collection procedures are described in the S&A Plan (Appendix E). Sampling rationale, locations, depths and other details are specified in the S&A Plan and the Environmental Assessment Report. Protocols and procedures for lab pack preparation and drum sampling are included in Clean Harbors Drum Handling Guidelines (Appendix B). Laboratory sample preservation and handling requirements are included in the Laboratory QA/QC Manual (Attachment 1).

5.1 Sample Container and Preservation Requirements

Appropriate bottles and preservatives will be shipped in sealed containers by the Laboratory to the site. Bottles and preservatives will be inspected upon receipt by field personnel. Any deviations from approved requirements will be reported to the DRAI Field Manager for resolution. Sample collection will not occur without the approval of the Field Manager or designee that all bottles and preservatives shipped by the laboratory are in conformance with the requirements presented in the Laboratory QA/QC Manual.

5.2 Chain of Custody Procedures

Defined in this QAPP are general Chain of Custody (COC) procedures which document the possession of samples from the time they are collected until their disposal. The specific COC procedures used by the laboratory are included in Attachment 2.

The COC form includes the project name, signature of samplers, sample number, date and time of sample collection, and the signature of personnel involved in sample transfer. Each sample location, sampling depth, and matrix will be assigned a unique sample identification number which will be designated on the COC as well as the field log book(s). Upon delivery of the samples, the laboratory will document the date and time of receipt and continue the COC under the internal laboratory COC procedures.

5.3 Field Documentation

Field work and sample collection activities will be documented in a bound field log book(s). The log books will be maintained on-site under the control of the DRAI Field Manager and will include all in-situ analytical results, sample matrix, location and depth. As mentioned, each sample will be assigned a unique field sample identification number. Appropriate observations and potential anomalies that may impact sample analysis and results will be noted in the log book and identified on the COC where applicable.

5.4 Sample Shipping

Samples will be packaged, labeled and preserved in an area free of contamination. The samples will be shipped to the laboratory, under the COC, within the time frame required to meet holding times for the required analyses. Upon receipt at the laboratory, samples will be inspected and any problems which may impact sample analysis or results will be recorded and the Laboratory Manager notified. The Laboratory Manager will contact the DRAI QA Manager regarding issues related to procedures for any affected samples.

6.0 ANALYSIS AND TESTING

The methods required to support the laboratory analytical requirements of the S&A Plan are provided in Table I. The analytical methods referenced represent the most recent promulgated methods for solid waste analysis pursuant to USEPA SW-846. All sample preparation and analysis will be conducted in accordance with the respective method requirements.

The methods referenced in SW-846, Final Update III, are standard methods and not likely to present any analytical problems. In the event that data analysis for any of these parameters fails method or laboratory QC requirements the samples will be reanalyzed as long as holding times are met.

All laboratory procedures are defined in the Laboratory QA/QC Manual (Attachment 1). In general, this information includes:

Sample Management/Sample Control
Reagent/Standard Preparation and Documentation
Corrective Action Procedures and Documentation
Waste Disposal Practices
Internal and External Laboratory Audits
Method Development Procedures and Results
Control Limit Procedures and Results

Trip blanks prepared with reagent water provided by the laboratory will accompany each sample cooler and will be analyzed for VOCs+10. In addition, VOCs+10 analysis will be performed for field duplicate ground water samples at a frequency of one per 20-sample batch, with a minimum of one per each day samples are collected.

6.1 Laboratory Instrumentation

Laboratory instruments will be employed per the methods identified for the laboratory parameters to be analyzed as part of the IM Work Plan and Supplemental RFI Work Plan. In general, VOCs will be analyzed by GC/MS, TOC by infrared spectroscopy and metals (e.g., iron) by ICP or graphite furnace. Laboratory instruments will be operated and maintained in accordance with the Laboratory QAPs (Appendix B).

6.2 Laboratory QA/QC Procedures

The overall QA/QC objective of both work plans is to collect data of sufficient quality to achieve the required DQOs as defined in Section 3.0 of this QAPP. Data quality is typically defined in terms of precision, accuracy, representativeness, completeness, and comparability. These terms are described further in the attached Laboratory QAPs and are summarized below.

6.2.1 Precision

Precision is a measure of the reproducibility of analytical data. It is estimated by means of duplicate/replicate sample analysis. The duplicate samples can be actual samples analyzed in replicate or matrix spike samples run in duplicate. Typically, estimates of precision are based on a calculated relative percent difference (RPD).

Duplicate samples and subsequent RPD calculation will be performed on a per-batch basis. For the purposes of this QAPP, a batch is defined as a similar group of samples which is processed as a unit. Where the number of samples in the group is greater than 20, each group of 20 samples or less will constitute a batch. The RPD results will be compared to the requirements specified in the method or laboratory-derived RPD control limits.

6.2.2 Accuracy

Accuracy is a function of the agreement between an observed value and an accepted reference value. Blank spike, matrix spike and matrix spike duplicate recoveries can all be used as a measurement of accuracy.

Spiked samples will be run and recoveries determined on a per batch basis. The recoveries will be compared to method defined recovery limits or laboratory derived limits.

6.2.3 Representativeness

Representativeness is more of a qualitative determination to evaluate how the samples collected during a site investigation reflect the actual site conditions. An evaluation of representativeness may consider the number of sample locations and samples; sampling procedures; analytical methods; method detection limits (MDLs); field observations; and a comparison of the results obtained to historical information and data. The proposed sampling procedures and analytical methods are designed to provide data that are representative of current site conditions.

6.2.4 Completeness

Completeness involves the amount of valid data obtained during an investigation compared to the amount required to achieve the project DQOs. The goal is to obtain 100% valid data; however, based on site conditions, for example, the potential for elevated VOC concentrations and possible matrix interferences, this goal may not be achievable or necessary. A discussion of the completeness of data in meeting the site investigations' DQOs will be presented in the IM and Supplemental RFI Reports. If at any time during the project, completeness becomes an issue, potential corrective action will be evaluated.

6.2.5 Comparability

The use of standard sample collection procedures and analytical methods assures consistency of data between sample rounds and the data points from the sampling event. The samples collected during the investigations will be obtained and analyzed using standard methods and protocols. Where any differences from approved sampling protocols or analytical methods are required based on site conditions or matrix interferences, the deviations will be noted in the field log book(s) and/or laboratory data packages. This will ensure that the data will be directly comparable with existing site data and between the samples collected during this sample round. In the event deviations are required, sufficient documentation will be available to evaluate the degree of comparability of the data.

7.0 DATA REDUCTION AND VALIDATION

This QAPP applies to the S&A Plan which are required by the Order. The information regarding non-direct measurements such as literature reviews, historical site information, etc., is included in the Environmental Assessment Report.

In the laboratory, data that has been reviewed through the validation process is entered into the Laboratory Information Management System (LIMS). Data verification is performed after it has been entered into LIMS by experienced staff independent of data entry functions.

All laboratory reports and data packages must be approved and signed by the Laboratory Manager or designee. Electronic Data Deliverables (EDD) are generated by MIS personnel. Electronic files are verified before being sent to the client. The files are either sent through the mail or delivered electronically.

For data storage the SOPs require that each sample delivery group be assigned a unique number when entered into the LIMS. The computer records are maintained on the system for a period of one year the archived on magnetic tape. Two system backup copies are maintained on tape at all times. The tapes are stored in a fireproof safe at the laboratory indefinitely.

Hard copies of the reports are maintained onsite for six to eight months then removed to archive storage for a period of three to ten years as contracted with the client.

7.1 Data Reduction

All laboratory-generated data will be presented in tables in the IM and Supplemental RFI Reports. Included in these tables will be the sample identification number, matrix, parameters, results, units, and detection limits. Where applicable, footnotes will also be included to identify data qualifiers.

Data reduction will consist of summarizing the field and laboratory-generated data. DRAI will be responsible for this aspect of the project. Laboratory data may be submitted electronically to DRAI. All appropriate data will be presented in tables and figures and in any other manner necessary to illustrate data results for ease of interpretation (e.g., site plans).

7.2 Data Validation

The laboratory-generated data will be subject to 100% data validation (performed internally by the laboratory). The data validation will consist of two levels of evaluation: (1) sampling sample preservation, holding times, etc; and (2) precision, accuracy and other method-defined performance criteria. The laboratory will submit a detailed Conformance-Non Conformance Summary with each data package. This summary will contain, at a minimum, method-defined criteria, any non-conformance with the criteria, any corrective actions implemented and a discussion of the impact that the non-conformance will or could have on the data.

One hundred percent of the VOC data will be subjected to a more rigorous, third-party data validation (Level IV). Where method criteria are specified, the criteria must be achieved or required corrective actions documented.

The USEPA has not developed data validation protocols for the SW-846 VOC methods. Therefore, the CLP validation protocol (USEPA SOP HW-6, Rev. 11, June 1996: CLP Organics Data Review and Preliminary Review) will generally be followed with allowances for items that do not directly apply to the SW-846 methodologies because of the differences in methods, laboratory requirements, etc. between the CLP and SW-846.

8.0 DATA MANAGEMENT AND REPORTS

8.1 Field Records

All field documentation will be maintained on-site during the investigations. This will include, but not be limited to, field log books and COC records. The information will be kept in a secure location and be under the control of the DRAI Field Manager.

Upon completion of the investigation, all field documentation will be maintained in a secure location at the DRAI office. All documents will be kept for a minimum of 5 years after USEPA approval of the final reports.

8.2 Laboratory Records

Laboratory records will be maintained at the laboratory in a secure location. This will include sample management information, any corrective action reports, internal COC documentation, QA/QC reports, etc.

All laboratory data packages will include CLP-type documentation, however not on CLP forms. The packages will also include a detailed Conformance/Non-Conformance summary. Copies of the data packages will be maintained at the laboratory and at the DRAI office. A copy of all data packages will also be forwarded to the USEPA.

8.3 Reports

Upon completion of the investigation and receipt of all of the laboratory data, draft reports for the IM and Supplemental RFI will be prepared by DRAI. Copies will be sent to Edgewater Enterprises and the USEPA for comments. After approval, final reports will be prepared. Copies of the draft and final reports will be maintained at the DRAI office for a minimum of 5 years.

Pursuant to the Order, "Non-CLP Superfund Analytical Services Tracking Form" (Attachment 3) will be completed for all the laboratory analytical results generated in association with the S&A Plan.

TABLE I

Laboratory Analytical Methods

TABLES

VOLATILES	Target Compound List	TCLP (Method 1311)	MDLs Aqueous Method 624 (ppb)	MDLs Soil Method 8260B (ppb)	MDLs Methanol Soil Method 5035/8260B (ppb)
Acetone	x		1.333	20	2500
Benzene	x	x	0.210	5	625
Bromochloromethane	x		0.547	5	625
Bromodichloromethane	x		0.290	5	625
Bromoform	x		0.395	5	625
Bromomethane	x		0.336	5	625
2-Butanone(MEK)	x	x	1.119	20	2500
Carbon disulfide	x		0.290	5	625
Carbon tetrachloride	x	x	0.408	5	625
Chlorobenzene	x	x	0.234	5	625
Chloroethane	x		0.530	5	625
Chloroform	x	x	0.281	5	625
Chloromethane	x		0.354	5	625
cis-1,2-Dichloroethene	x		0.243	5	625
cis-1,3-Dichloropropene	x		0.244	5	625
Cyclohexane	x		0.935	5	625
1,2-Dibromo-3-chloropropane	x		0.763	5	625
Dibromochloromethane	x		0.437	5	625
1,2-Dibromoethane/Ethylene dibromide(EDB)	x		0.361	5	625
1,4-Dichlorobenzene	x	x	0.220	5	625
Dichlorodifluoromethane	x		0.552	5	625
1,1-Dichloroethane	x		0.317	5	625
1,2-Dichloroethane(EDC)	x	x	0.259	5	625
1,1-Dichloroethene	x	x	0.482	5	625
1,2-Dichloropropane	x		0.401	5	625
Ethylbenzene	x		0.226	5	625
2-Hexanone	x		0.590	20	2500
Isopropylbenzene	x		0.245	5	625
Methyl acetate	x		0.540	5	625
Methylcyclohexane	x		0.180	5	625
4-Methyl-2-pentanone/Methyl Isobutyl Ketone (MIBK)	x		0.472	20	2500
Methylene Chloride	x		0.558	5	625
Methyl-tertiary-butyl ether(MTBE)	x		0.304	5	625
Styrene	x		0.225	5	625
1,1,2,2-Tetrachloroethane	x		0.360	5	625
Tetrachloroethene (PERC)	x		0.393	5	625
Toluene	x		0.255	5	625
Total Xylenes	x		0.491	5	625
trans-1,2-Dichloroethene	x		0.399	5	625
trans-1,3-Dichloropropene	x		0.340	5	625
1,2,3-Trichlorobenzene	x		0.381	5	625
1,2,4-Trichlorobenzene	x		0.294	5	625
1,1,1-Trichloroethane	x		0.355	5	625
1,1,2-Trichloroethane	x		0.347	5	625
Trichloroethene	x	x	0.378	5	625
Trichlorofluoromethane	x		0.468	5	625
1,1,2-Trichlor-1,2,2-trifluorethane	x		0.633	5	625
Vinyl Chloride	x	x	0.408	5	625

MDLs are instrument averages and may vary depending on the instrument used for analysis.

SEMIVOLATILES	Target Compound List	TCLP (Method 1311)	MDLs Aqueous Method 625 (ppb)	MDL's Soil Method 8270C (ppb)
Acenaphthene	x		0.313	33.3
Acenaphthylene	x		0.289	33.3
Acetophenone	x		0.658	
Anthracene	x		0.436	33.3
Atrazine	x		0.526	
Benzaldehyde	x		0.368	
Benzo[a]anthracene	x		0.325	33.3
Benzo[a]pyrene	x		0.447	33.3
Benzo[b]fluoranthene	x		0.850	33.3
Benzo[g,h,i]perylene	x		0.272	33.3
Benzo[k]fluoranthene	x		0.890	33.3
1,1-Biphenyl	x		0.484	
Bis(2-chloroethoxy)methane	x		0.521	33.3
Bis(2-chloroethyl)ether	x		0.707	33.3
Bis(2-chloroisopropyl)ether	x		0.362	33.3
Bis(2-ethylhexyl)phthalate	x		0.614	33.3
4-Bromophenyl-phenylether	x		0.460	33.3
Butylbenzylphthalate	x		0.553	33.3
Caprolactam	x		0.263	
Carbazole	x		0.366	33.3
4-Chloro-3-methylphenol	x		0.292	33.3
4-Chloroaniline	x		0.460	33.3
2-Chloronaphthalene	x		0.491	33.3
2-Chlorophenol	x		0.371	33.3
4-Chlorophenyl-phenylether	x		0.496	33.3
Chrysene	x		0.320	33.3
Dibenz[a,h]anthracene	x		0.328	33.3
Dibenzofuran	x		0.447	33.3
1,4-Dichlorobenzene		x	0.386	33.3
3,3'-Dichlorobenzidine	x		0.588	33.3
2,4-Dichlorophenol	x		0.382	33.3
Diethylphthalate	x		0.414	33.3
Dimethylphthalate	x		0.420	33.3
2,4-Dimethylphenol	x		0.446	33.3
Di-n-butylphthalate	x		0.472	33.3
4,6-Dinitro-2-methylphenol	x		0.612	33.3
2,4-Dinitrophenol	x		0.368	33.3
2,4-Dinitrotoluene	x	x	0.380	33.3
2,6-Dinitrotoluene	x		0.448	33.3
Di-n-octylphthalate	x		0.611	33.3
Fluoranthene	x		0.461	33.3
Fluorene	x		0.403	33.3
Hexachlorobenzene	x	x	0.576	33.3
Hexachlorobutadiene	x	x	0.755	33.3
Hexachlorocyclopentadiene	x		0.517	33.3
Hexachloroethane	x	x	0.523	33.3
Indeno[1,2,3-cd]pyrene	x		0.367	33.3
Isophorone	x		0.430	33.3
2-Methylnaphthalene	x		0.512	33.3
2-Methylphenol (o-Cresol)	x	x	0.626	33.3
3+4-Methylphenol (m+p Cresol) **TCLP ONLY**		x	~	NA
4-Methylphenol (p-Cresol)	x		0.576	33.3

SEMIVOLATILES	Target Compound List	TCLP (Method 1311)	MDLs Aqueous Method 625 (ppb)	MDL's Soil Method 8270C (ppb)
Napthalene	x		0.700	33.3
2-Nitroaniline	x		0.639	33.3
3-Nitroaniline	x		0.600	33.3
4-Nitroaniline	x		0.423	33.3
Nitrobenzene	x	x	0.548	33.3
2-Nitrophenol	x		0.433	33.3
4-Nitrophenol	x		0.579	33.3
N-Nitroso-di-n-propylamine	x		0.614	33.3
N-Nitrosodiphenylamine	x		0.392	33.3
Pentachlorophenol	x	x	0.432	33.3
Phenanthrene	x		0.285	33.3
Phenol	x		0.827	33.3
Pyrene	x		0.235	33.3
Pyridine **(TCLP Only)**		x	0.685	NA
1,2,4,5-Tetrachlorobenzene	x		0.462	
2,4,5-Trichlorophenol	x	x	0.506	33.3
2,4,6-Trichlorophenol	x	x	0.688	33.3

MDLs are instrument averages and may vary depending on the instrument used for analysis.

PESTICIDES	Target Compound List	TCLP (Method 1311)	MDLs Aqueous Method 8081A (ppb)	MDLs Soil Method 8081A (ppb)	MDLs TCLP Method 1311 (ppm)
4,4'-DDD	X		0.002	0.170	
4,4'-DDE	X		0.002	0.170	
4,4'-DDT	X		0.002	0.170	
Aldrin	X		0.002	0.170	
alpha-BHC	X		0.002	0.170	
alpha-Chlordane	X	X	0.002	0.170	0.0004
beta-BHC	X		0.002	0.170	
delta-BHC	X		0.002	0.170	
Dieldrin	X		0.002	0.170	
Endosulfan I	X		0.002	0.170	
Endosulfan II	X		0.002	0.170	
Endosulfan sulfate	X		0.002	0.170	
Endrin	X	X	0.002	0.170	0.0004
Endrin aldehyde	X		0.002	0.170	
Endrin Ketone	X		0.002	0.170	
gamma-BHC (Lindane)	X	X	0.002	0.170	0.0004
gamma-Chlordane	X	X	0.002	0.170	0.0004
Heptachlor	X	X	0.002	0.170	0.0004
Heptachlor Epoxide	X		0.002	0.170	
Methoxychlor	X	X	0.002	0.170	0.0004
Toxaphene	X	X	0.150	0.830	0.003

HERBICIDES	Standard List	TCLP	MDLs Aqueous Method 8151A (ppb)	MDLs Soil Method 8151A (ppb)	MDLs TCLP Method 1311/8151A (ppm)
2,4,5-TP (Silvex)	X	X	0.10	3.33	0.0001
2,4-D	X	X	0.10	3.33	0.0001
2,4-DB	X		0.10	3.33	
Dalapon	X		0.10	3.33	
Dicamba	X		0.10	3.33	
Dichloroprop	X		0.10	3.33	
Dinoseb	X		0.10	3.33	
MCPA	X		0.50	16.7	
MCPP	X		0.50	16.7	
2,4,5-T	X		0.10	3.33	

METALS	Target Compound List	TCLP	MDLs - Aqueous Method 6020 (ppb)	MDLs - TCLP Method 1311/6020 (ppb)	MDLs - Soil Method 6020 (ppm)	MDLs - Aqueous Method 200.8 (ppb)	MDLs - Aqueous Method 200.7 (ppb)
Aluminum	X		40	40	10	40	
Antimony	X		4	4	1	4	
Arsenic	X	X	4	4	1	4	
Barium	X	X	40	40	10	40	
Beryllium	X		2	2	0.5	2	
Cadmium	X	X	1	1	0.25	1	
Calcium	X		200	0.2	50	200	1050
Chromium	X	X	8	8	2	8	
Cobalt	X		8	8	2	8	
Copper	X	X *	8	8	2	8	
Iron	X		100	100	25	100	30.5
Lead	X	X	2	2	0.5	2	
Magnesium	X		200	200	50	200	134
Manganese	X		20	20	5	20	
Mercury	X	X	☒	☒	☒	☒	☒
Molybdenum	X*		20	20	5	20	
Nickel	X	X*	4	4	1	4	
Potassium	X		200	200	50	200	358
Selenium	X	X	8	8	2	8	
Silver	X	X	2	2	0.5	2	
Sodium	X		400	400	100	100	74.8
Thallium	X		0.4	0.4	0.1	0.4	
Vanadium	X		8	8	2	8	
Zinc	X	X*	8	8	2	8	

☒ = MDL for TCLP, Wastewater & Monitoring Well is 0.500 ppb by Cold vapor and 0.0125 ppm for Soil by Cold Vapor.

* = compound must be requested, not normally analyzed for.

MISCELLANEOUS COMPOUNDS	MDLs Soil	MDLs Aqueous	Aqueous Method	Soil Method
Cyanide, Total (ppm)	1.0	0.02	335.2	3545, REV 0
Phenol (ppm)	2.5	0.05	420.2	9065 & 9066
Cyanide, Reactive (ppm)	10	10	7.3.3.2	7.3.3.2
Ignitability @ 142°F (Yes/No)	NA	NA	1030	1030
Sulfide, Reactive (ppm)	16	16	7.3.4.2	7.3.4.2
Corrosivity as pH (S.U.)	±0.02	±0.02	150.1	9040B

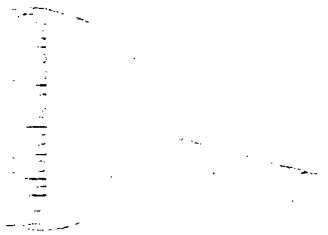
ATTACHMENTS

ATTACHMENT 1

ATTACHMENT 1

Quality Assurance/Quality Control Manual
(Integrated Analytical Laboratories, LLC)

Quality Assurance/ Quality Control Manual



Laboratory Director
Michael H. Leftin, Ph.D.

QA Officer
Regina Ramsay

IALQAM Revision 13
06-Sept-02

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Table of Contents

Service Philosophy

Integrated Analytical Laboratories, LLC (IAL) is a full service environmental laboratory dedicated to providing high quality analytical data. Our philosophy maintains that high quality data can only be achieved through a combination of state-of-the-art instrumentation and a team of highly qualified professionals. This is passed onto our clients in the form of timely, accurate and cost efficient analytical data reports.

The management of IAL stresses communication at all levels and strives to maintain an atmosphere of excellence, which our customers deserve. IAL is continually upgrading our operations to remain current with the latest technical advances in instrumentation and procedures, as well as, the latest rules and regulations.

This manual describes the Quality Assurance/Quality Control procedures at IAL in compliance with the New Jersey Department of Environmental Protection (NJDEP). All procedures in this manual are enforced by laboratory personnel and are EPA/NJDEP-NELAC approved.

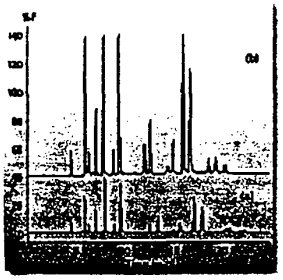
Integrated Analytical Laboratories, LLC maintains certification in several states throughout the US. IAL is certified by the New Jersey Department of Environmental Protection (No. 14751) as a NELAC laboratory. IAL is also certified by the New York Department of Health-ELAP (No. 11402), the Connecticut Department of Public Health (PH-0699) and the Rhode Island Department of Health (No.126). IAL is routinely adding new states to our list profile. The most current information can be obtained by contacting our QA Department.

IAL operates under a quality assurance program, which touches on every level of the company and controls all aspects of the analysis of samples.

Michael H. Leftin, Ph.D.
Laboratory Director

Regina Ramsay
QA Officer

Quality Policy



IAL is committed to the production of analytical data of the highest quality and to continuous improvement in all areas of our operation. Only procedures and techniques meeting the highest standards will be used. Because of having a focus on environmental analyses, an emphasis is placed on timeliness of work, exacting quality, and dependable, legally defensible data. Each operation maintains a local perspective in its scope of services and client relations and maintains a national perspective in terms of quality. Under the guidance of this quality assurance manual, a level of quality, which is acceptable on a national and international scale, is upheld in all IAL operations.

The corporate goal for all segments of IAL operations is for quality of the highest caliber. The process of achieving this goal entails continuous evaluation and action. IAL management requires documentation of existing practices and improvement action plans at every stage in the improvement process. Management follows this documentation process in order to demonstrate control of the laboratory operations.

A spirit of innovation is an essential element to the success of IAL in solving the complicated analytical problems encountered in environmental samples. This spirit, combined with the discipline and attention to detail required to provide the level of service expected by our customers, is what makes IAL stand out among others in this field. This same spirit is what drives the continuous striving for quality improvement and is the keystone to the IAL quality program.

- **Communication**

IAL has a strong commitment to making all of the parts of the organization work together. The Laboratory Director stays current in the daily events of the lab. Reporting directly to the Lab Director are the QA Officer, Organics Manager, Inorganics Manager (Metals Dept.) and the General Chemistry Manager. The Lab Director and Managers meet monthly to discuss the current status of their departments, future requirements, company goals, employee issues, etc.

Reporting directly to the Managers are the chemists and technicians in each department. Each department has a hands-on, working Supervisor, responsible for daily schedules, immediate issues and substituting in the Managers absence.

All departments meet each month. All employees in the department are required to attend the monthly meetings.

Quality Assurance Objectives

Integrated Analytical Laboratories, LLC quality assurance objectives are described below:

- **Precision**

The laboratory objective for precision is to equal or exceed the precision demonstrated for these analytical methods on similar samples and to meet or exceed precision data for these analyses published by the U.S. EPA. Precision is defined as the degree of reproducibility of the measurements under a given set of conditions. Precision is documented based on replicate analyses.

- **Accuracy**

The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for these analytical methods on similar samples and to perform better than the recovery data published by the U.S. EPA. Accuracy is defined as the bias in a measurement system. Accuracy is documented based on recovery of matrix spikes, and spiked reference materials introduced into selected samples of a particular matrix.

- **Completeness**

The laboratory objective for completeness of an analysis is to provide sufficient data of acceptable quality such that the goals of the analytical project can be achieved within the time frame required.

- **Comparability**

The laboratory goal for our comparability objective is to provide analytical data, which the accuracy, precision, completeness and detection limit are similar to these quality indicators for data generated by other laboratories for similar samples, and for data generated by IAL over time. The comparability objective is documented by inter-laboratory studies carried out by regulatory agencies, specific projects, or contracts, and by comparison, of periodically generated statements of accuracy, precision, and detection limits.

Quality Policy and Objectives - *continued*

Integrated Analytical Laboratories, LLC is an environmental testing facility working to insure our employees are insulated from work related undue pressures, which could compromise the quality of our data.

- **Management Pressures and Unrealistic Deadlines**

The management of IAL realizes that imposing unrealistic deadlines on the laboratory system and employees ultimately results in system overload and undue stress on our employees. We follow a very strict protocol to insure this does not happen.

All new projects, as presented by the sales staff, are reviewed by the Laboratory Management team prior to in-house acceptance. The Laboratory Management team consists of the Laboratory Manager and all Department Managers. New projects are reviewed on a case-by-case basis with input from Project Management, Department Managers, and the Sales staff.

The Laboratory Management team will review items such as:

- All aspects of the project (i.e. analytical requirements, turn around times, number of samples, delivery of bottles/pickup of samples);
- Current laboratory work load;
- Available laboratory staff;
- Instrumentation limitations;
- Prior approved projects.

Refer to IALSOP1.2300 for New Projects. All management decisions are geared towards providing quality work and recognize that placing unnecessary demands and unrealistic deadlines on our employees will not accomplish this goal.

All Sales staff members employed by IAL report directly to the Laboratory Manager. Members of the Sales staff are not permitted to directly influence any member of the IAL analytical staff with specific client requests or demands.

The Project Management team at IAL maintains all client contact on every project in-house. Client contact between IAL employees other than the Project Management team is strictly prohibited. Clients cannot contact individual analysts, department managers, or other IAL employees to request sample prioritizing, make complaints, issue requests, and/or offer gifts and gratuities.

The Project Management team in turn does not make unwarranted demands on IAL employees to modify pre-existing arrangements. Minor adjustments can be negotiated between the Project Management individuals and laboratory staff members but not by means of undue pressure.

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- **Conflicts of Interest**

Conflicts of interest are avoided by the use of a team approach to the acceptance of client requirements rather than by the consent of an individual.

Integrated Analytical Laboratories, LLC offers an "open door" policy to IAL employees. All employees are urged to air grievances. Employees can discuss problems, which may affect their working capabilities with any member of the IAL management staff or the Laboratory Manager. All situations will be handled on an individual basis.

Quality Assurance Systems

This section is concerned with the quality of the laboratory support systems, the infrastructure, which supports the analytical equipment and processes, sample integrity and sample handling processes, and the clients' sampling programs.

- **Required Equipment**

IAL's analytical system begins with the acquisition of high quality equipment to ensure efficient operation of the laboratory. IAL obtains equipment and supplies, which meet or exceed the specifications of analytical methods. Glassware, reagents, gases, and replacement parts for analytical instruments are purchased from reputable suppliers with a history of quality customer service. All supplies meet or exceed the specifications set forth in the method or of recognized professional groups such as the American Chemical Society (ACS), American Society for Testing and Materials (ASTM), and the Association of Official Analytical Chemists (AOAC). See Appendix Section B of this manual for a list of the major equipment used by IAL.

- **Safety and Environmental Factors**

Factors in the environment of the laboratory affect the proper and safe functioning of the equipment, and chemical procedures. Safety and design features provide an environment conducive to efficient and effective work on the part of analysts.

- **Prevention of Cross-Contamination**

Design features intended to control cross contamination include the following

1. The physical separation of extractable and volatile organics operations.
2. The installation of hoods and air handling equipment in order to vent vapors out of solvent sample handling areas.
3. Segregated sample storage areas.
4. Microbiological cross-contamination is checked by performing sterile control test samples analyzed at the beginning and end of the sequence, as well as after every seven samples. Each batch of bottles, water and media are checked for sterility.

Quality Assurance Systems - *continued*

- **Reagent Water Quality**

Reagent, analyte-free grade, or laboratory-pure water means distilled or deionized water meeting the specifications of ASTM Type II reagent water. This water is free of contaminants that may interfere with the analytical analyses being performed. IAL purchases certified laboratory pure water from a reputable dealer, to insure strict adherence to quality criteria. All purchased water is tested in-house prior to use. Refer to IAL SOP 1.1700.

- **Glassware Cleaning**

Glassware cleaning procedures are posted in the glassware cleaning area. Documented in IAL SOP 1.1200, all glassware cleaning procedure meets EPA requirements. Only phosphates-free laboratory grade detergents are used for the cleaning of glassware.

- **Cleaning of Sampling Containers**

IAL purchases certified pre-cleaned sampling containers for use by our clients. All sampling containers and sampling container-cleaning procedures meet EPA criteria. Manufacturer certificates of analysis are kept on file in the QA office.

- **Sampling Quality Assurance**

The overall quality of data can be no better than the quality of the sample provided to the analyst. IAL takes particular care to insure the integrity of all the samples in our laboratory system. All samples received at IAL are labeled and bar-coded with an individual, unique identification number. Samples are stored in locked refrigerators until requested by the analyst. The detailed Chain of Custody forms supplied by IAL to our clients provide a means for keeping track of preservation and sample handling factors, which affect sample integrity. Recommended quality assurance practices for sampling and preservation, along with the holding time criteria to be met in the laboratory, are outlined in another section of the QA Manual.

- **Recommended Containers, Preservation and Holding Times**

The preservation and holding time criteria specified in the enclosed Tables come from a variety of regulatory sources. The information contained in these tables is subject to regulatory revision at irregular intervals. IAL updates and circulates any revisions as soon as they are available.

Organization and Staff Structure

- **Management Team**

The Laboratory Director maintains an overview of all aspects of the company. He combines knowledge of chemistry and business to keep IAL on track.

The Quality Assurance Officer reports directly to the Lab Director. The QA Officer coordinates all quality assurance responsibilities in the laboratory. Please refer to page 10 of this manual, for a more detailed description of the QA Officer.

The Organics Manager reports directly to the Lab Director. The duties and responsibilities of the Organics Manager include quality control of all aspects of the GC and GC/MS analytical departments, maintaining instrument function, overseeing initial and ongoing training regiments for all employees in the two departments. The Organics Manager is responsible for reviewing and implementing new procedures and methodologies. It is also his responsibility to insure that sufficient personnel, instrumentation and equipment are available for optimal operation of the department.

The Inorganics Manager reports directly to the Lab Director. The duties and responsibilities of the Inorganics Manager include quality control of all aspects of the metals department, monitoring employee performance in both the analytical division and the preparation division, maintaining instrument function, overseeing initial and ongoing training regiments for all employees. The Inorganics Manager is responsible for reviewing and implementing new procedures and methodologies. It is also his responsibility to insure that sufficient personnel, instrumentation and equipment are available for optimal operation of the department.

The General Chemistry Manager reports directly to the Lab Director. The duties and responsibilities of the General Chemistry Manager include quality control of all aspects of the department. He monitors employee performance, maintains instruments, oversees initial and ongoing training regiments for all employees. The General Chemistry Manager is responsible for reviewing and implementing new procedures and methodologies. It is also his responsibility to insure that sufficient personnel, instrumentation and equipment are available for optimal operation of the department.

Organization and Staff Structure - *continued*

The Sales staff reports directly to the Lab Manager. Each Account Manager is required to follow a strict protocol when presented with a new scope of work from his/her client. The size of the project as well as the analyses requested will determine the course of action. All new work and pending project proposals are discussed at the monthly meetings of the Sales department attended by the Laboratory Manager. Current laboratory workload can be balanced with incoming work during these discussions. To insure laboratory capability of a large or unusual project, the Account Managers are required to submit a copy of the client's scope of work to the Assistant Sales Associate. The Assistant Sales Associate will provide a copy of the pending project to the Laboratory Director, the QA Officer and the Client Services Division. Unusual analyses are assessed by the Lab Director, QA/QC requirements are addressed by the QA Officer and bottle shipments, pick-ups and turn around times are reviewed by the Client Services Division. All comments, questions and concerns are addressed prior to the samples being received at the lab.

- **Employees – Training and Experience**

All IAL employees are trained or hired as experienced personnel and evaluated for their capabilities.

All GC/MS Operators and Inorganic Metal Operators are required to participate in an intensive training program prior to achieving certified chemist status. Using a combination system of instruction by the Department Manager and the Department Supervisor, computer software programs, training manuals and hands on practice, the employee is evaluated for knowledge and capabilities.

The microbiological supervisor will meet the standards as stated in NJA C 7:18-2.10 including 4 microbiology credits from an accredited college and/or microbiological experience as required.

All IAL employees are hired on an initial three-month probationary period. This period is used to evaluate an employee's capabilities. The manager or supervisor of the department will perform a 30, 60 and 90-day evaluation.

Chemists and certified Operators will be provided with on-going education exposure from a variety of sources. New equipment purchases include training programs from the manufacturer. Associated employees are required to attend these training sessions. Employees are encouraged to participate in continuing education courses as well as attending seminars and conferences.

Organization and Staff Structure - *continued*

- **Quality Assurance/ Quality Control Program**

An integral part of the Integrated Analytical Laboratories, LLC Quality Assurance/ Quality Control Program are the systems put in place to assure the accuracy and validity of the processed data. To ensure these systems are carried out, specific duties and responsibilities have been delegated to various individuals.

Each person involved in the generation of data is explicitly part of the IAL QA/QC Program. The staff has specifically delegated QA/QC responsibilities.

The overall responsibility for quality lies with the Laboratory Director and the management team reporting to the Laboratory Director. The QA Officer and Laboratory Managers, who in turn report to the Laboratory Director, provide surveillance and maintenance of the quality assurance system.

All employees of IAL are responsible for knowing the content of the quality assurance manual and upholding the standards therein. Each member of the staff is obligated to carry out his/her daily tasks in a manner consistent with the goals expressed in the manual and in accordance with the procedures in the manual and laboratory standard operating procedures (SOPs).

- **Quality Assurance Officer**

The QA Officer coordinates all quality assurance responsibilities in the laboratory. The independence and objectivity of the QA/QC program depends on the QA Officer being independent of the data-generating process. In particular, for QA manual compliance issues, the QA Officer must maintain objectivity and independence. The QA Officer is responsible directly to the Laboratory Director for all non-compliance concerns not adequately addressed at the departmental level in a timely manner. The primary responsibility of the QA Officer is to ensure that the laboratory is operating in compliance with the QA Manual through a process of internal audits and necessary corrective actions. The QA Officer has the authority to perform laboratory audits without notice, submit control samples, and request access to data files and other information necessary to satisfy the goals of an independent audit. The QA Officer updates and reviews all QA/QC procedures, as needed, including the QA Manual, SOP Manual, methods, etc. The QA Officer monitors and implements all requirements for state certification programs, provides updates and assistance to all departments on new analytical methodologies and oversees review of client data reports.

Organization and Staff Structure - *continued*

- **Quality Control Coordinator**

The QC Coordinator will review the data package in its entirety for proper handling of the samples, analysis calculations, completeness of the data package and adherence to methodologies and standard operating procedures. The QC Coordinator oversees all aspects of the sample package from inception to completion.

- **Sample Custody Officer**

The Sample Custody Officer maintains records of all incoming samples, tracking those samples through the laboratory and ultimately overseeing disposal of the samples. This person is responsible for receiving the samples and incorporating them into the laboratory system. This person will also verify all incoming samples correspond to the chain of custody; were handled properly; distribute documentation received with the samples to the Sample Log-In Officer; and oversee handling, storage and disposal of all the samples.

- **Sample Log-In Officer**

The Sample Log-In Officer receives all the paperwork pertaining to a specific sampling event. This person inputs all project data into the central computer data system; reviews all chain of custody information and verifies questions/rectifies problems with the client project manager. The Sample Log-In Officer generates and distributes all in-house paperwork to laboratory departments for sample analysis.

- **Department Managers**

The Department Managers are responsible for all the individual laboratory activities. They train personnel in the required methods and operating procedures; verify laboratory QC and analytical procedures are being followed; reviewing data during and after acquisition; as well as addressing questions and problems that may arise.

- **Laboratory / Microbiological Technician**

Each Technician is responsible for the proper analysis of the samples. They analyze and process the data for all the required parameters on a sample. Their responsibility is to ensure the approved method/procedure is accurately and concisely adhered to and followed. The Technician is required to keep and maintain detailed, accurate notebooks and to discuss all problems with the department manager as needed.

Organization and Responsibility - *continued*

- **Approved Laboratory Signatories for Integrated Analytical Laboratories, LLC**

Michael H. Leftin
Laboratory Director

Regina Ramsay
QA Officer

Jim Yong Jin Shen
Organics Manager

Helge Falck-Jorgensen
Inorganics Manager

Robert Blank
General Chemistry and Microbiology Manager

Laboratory Director, Michael Leftin makes a final review of each laboratory data report before signing the data package for release to the client.

In the absence of the Lab Director, the QA Officer will sign the reports.

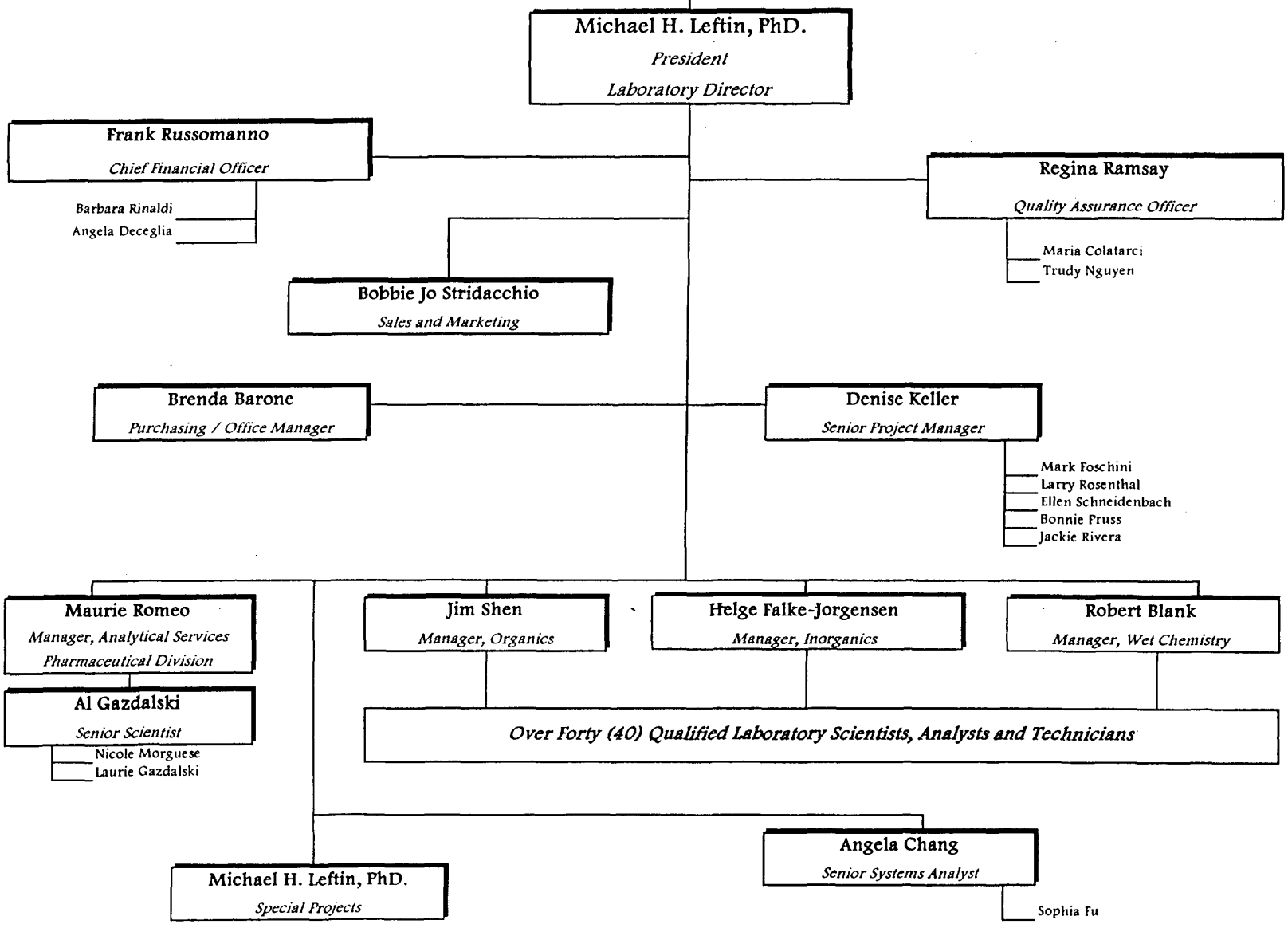
In the absence of the Laboratory Director, executive decisions will be made as a joint effort of the QA Officer and the Laboratory Managers.

Organizational Flow Chart

The structure of Integrated Analytical Laboratories, LLC is shown on the following organization flow chart:

INTEGRATED ANALYTICAL LABORATORIES, LLC
273 Franklin Road, Randolph, NJ 07869 Phone: (973) 361-4252, Fax: (973) 989-5288

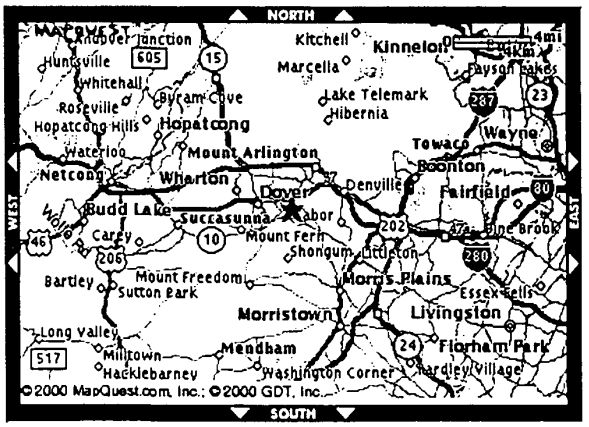
MENLO ACQUISITION CORPORATION



Integrated Analytical Laboratories, LLC

273 Franklin Road
Randolph, NJ 07869
(973) 361-4252 Fax: (973) 989-5288

Integrated Analytical Laboratories, LLC is located in Randolph, NJ. Conveniently accessible to Routes 287, 80, 46 and 10, IAL services a vast region of the Northeast. Laboratory operations are conducted in a 20,000 square foot facility, designed to meet production demands easily and efficiently.

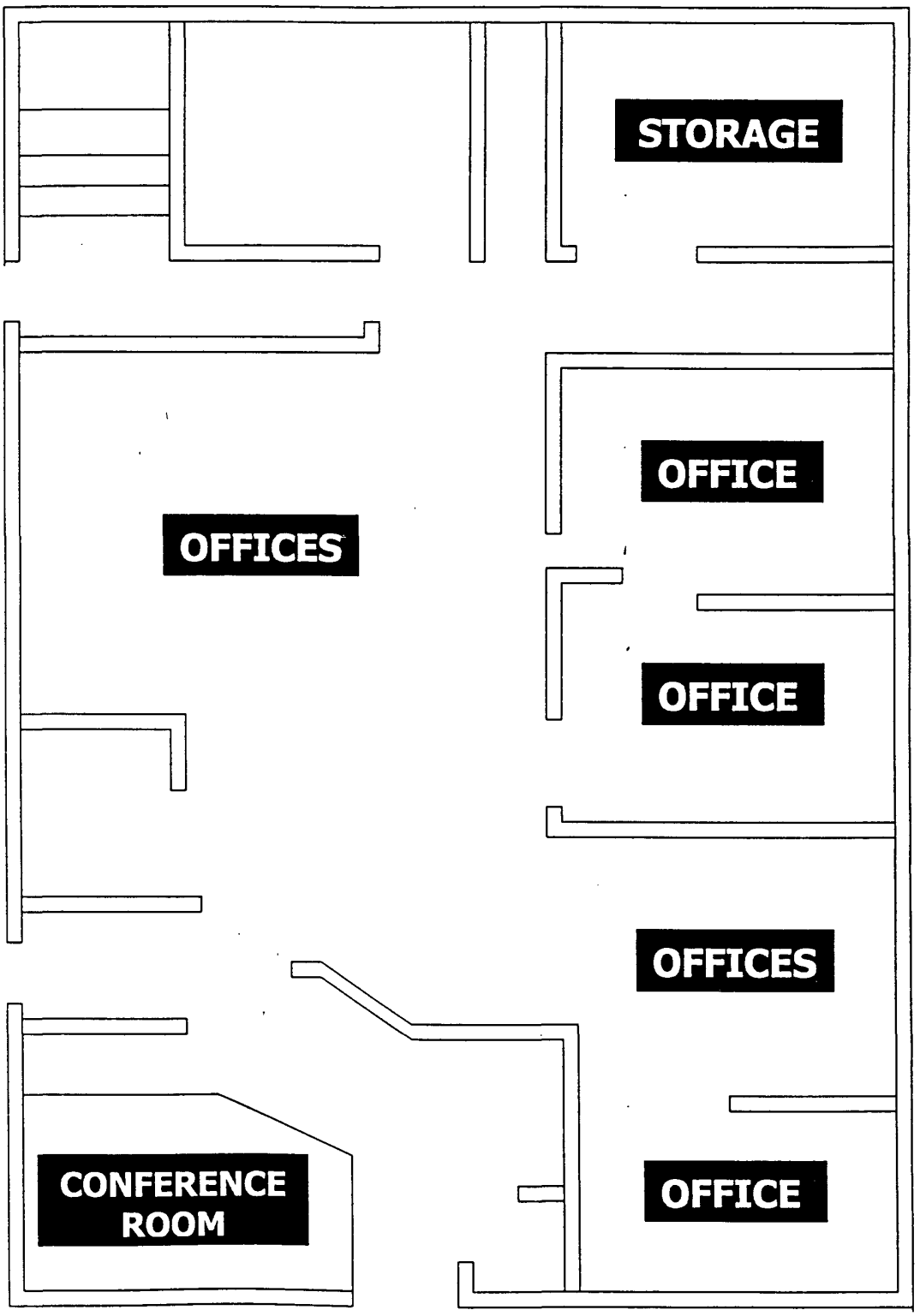


IAL employs a staff of approximately 60 qualified scientists, chemists, technicians and office personnel.

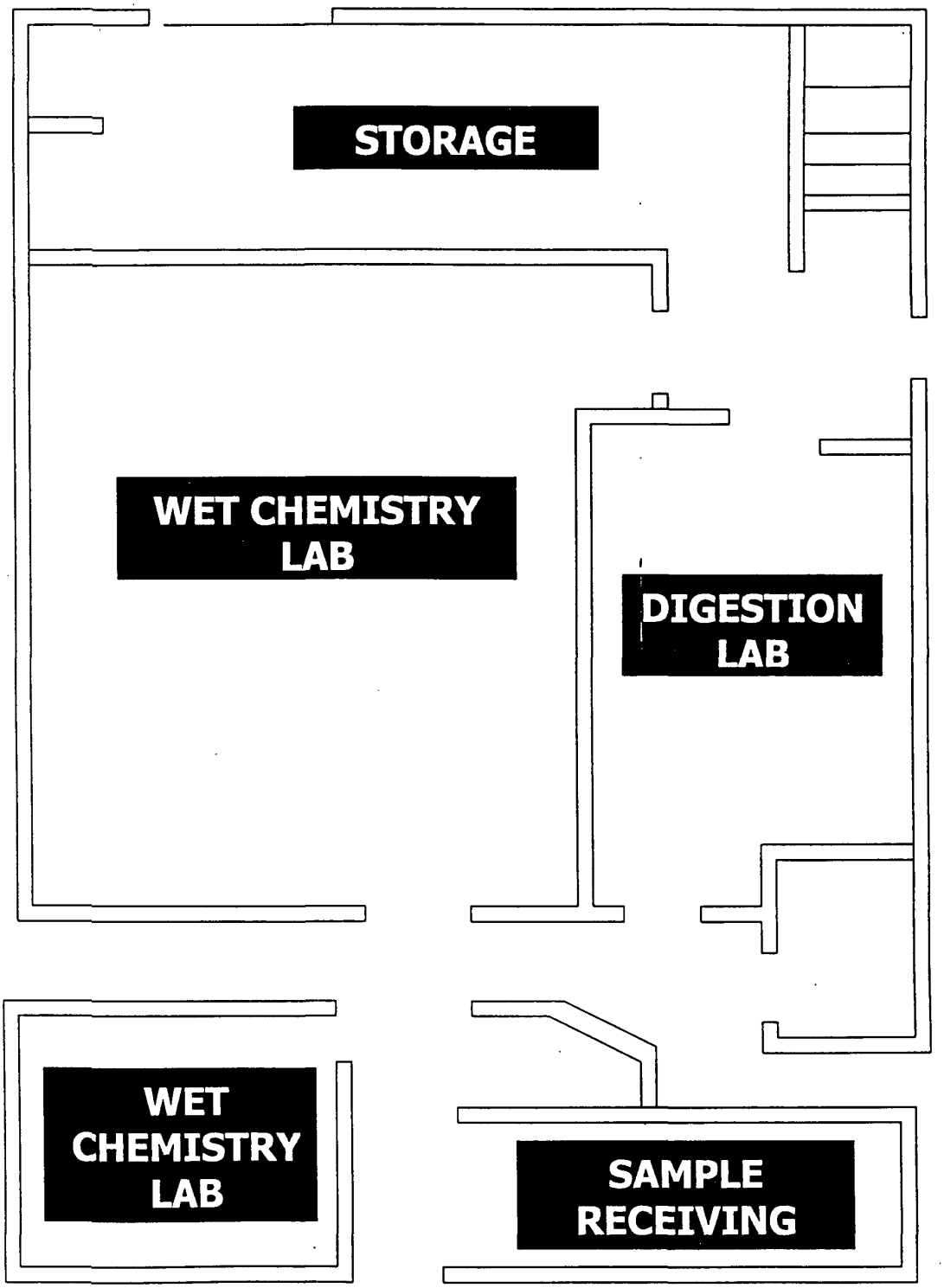
Please see the IAL facility floor plan on the following pages.

INTEGRATED ANALYTICAL LABORATORIES, LLC
Franklin Road, Randolph, NJ 07869 Phone: (973) 361-4252, Fax: (973) 989-5288

UNIT A



UNIT B



SAMPLE RECEIVING ENTRANCE

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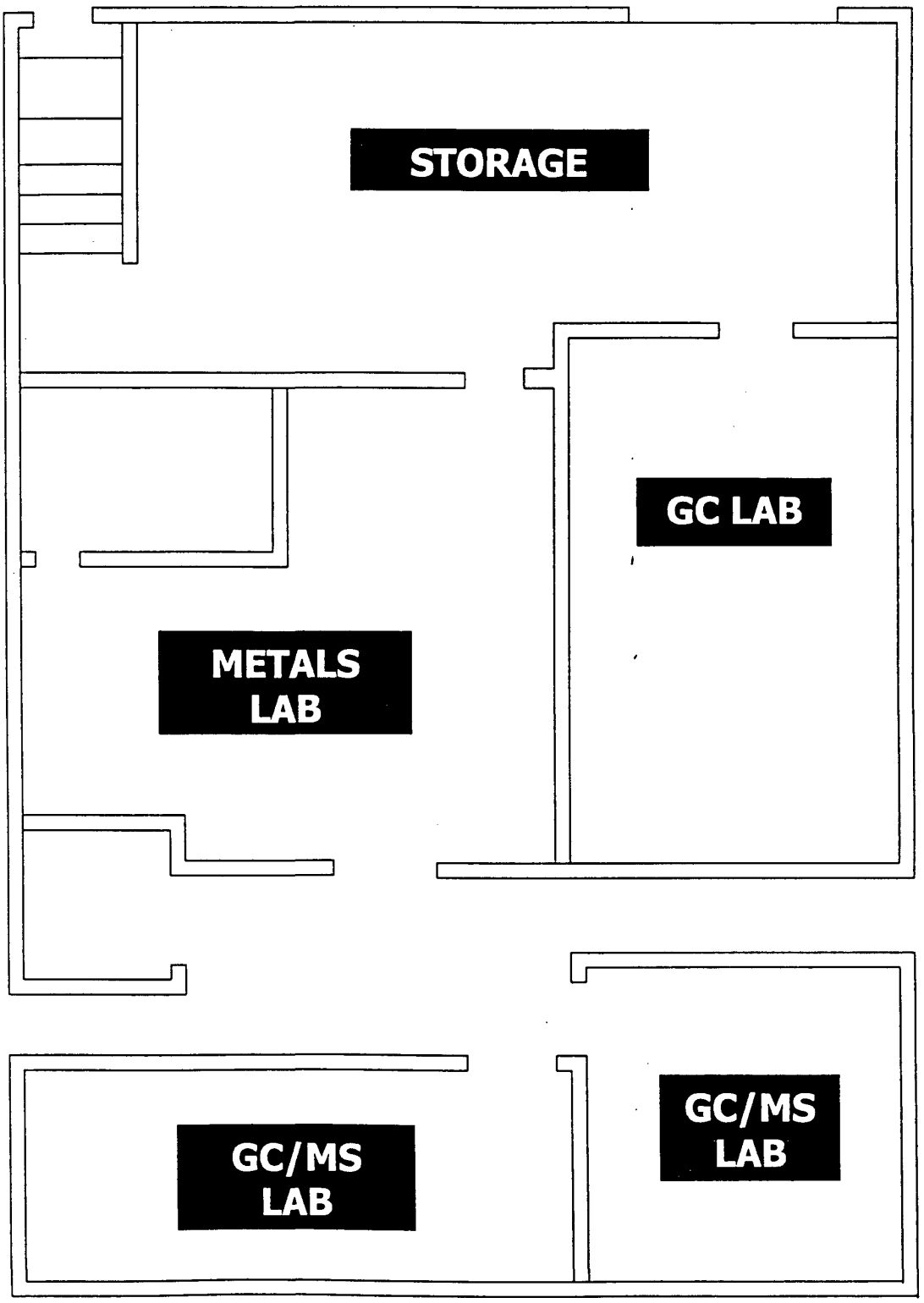
UNIT C



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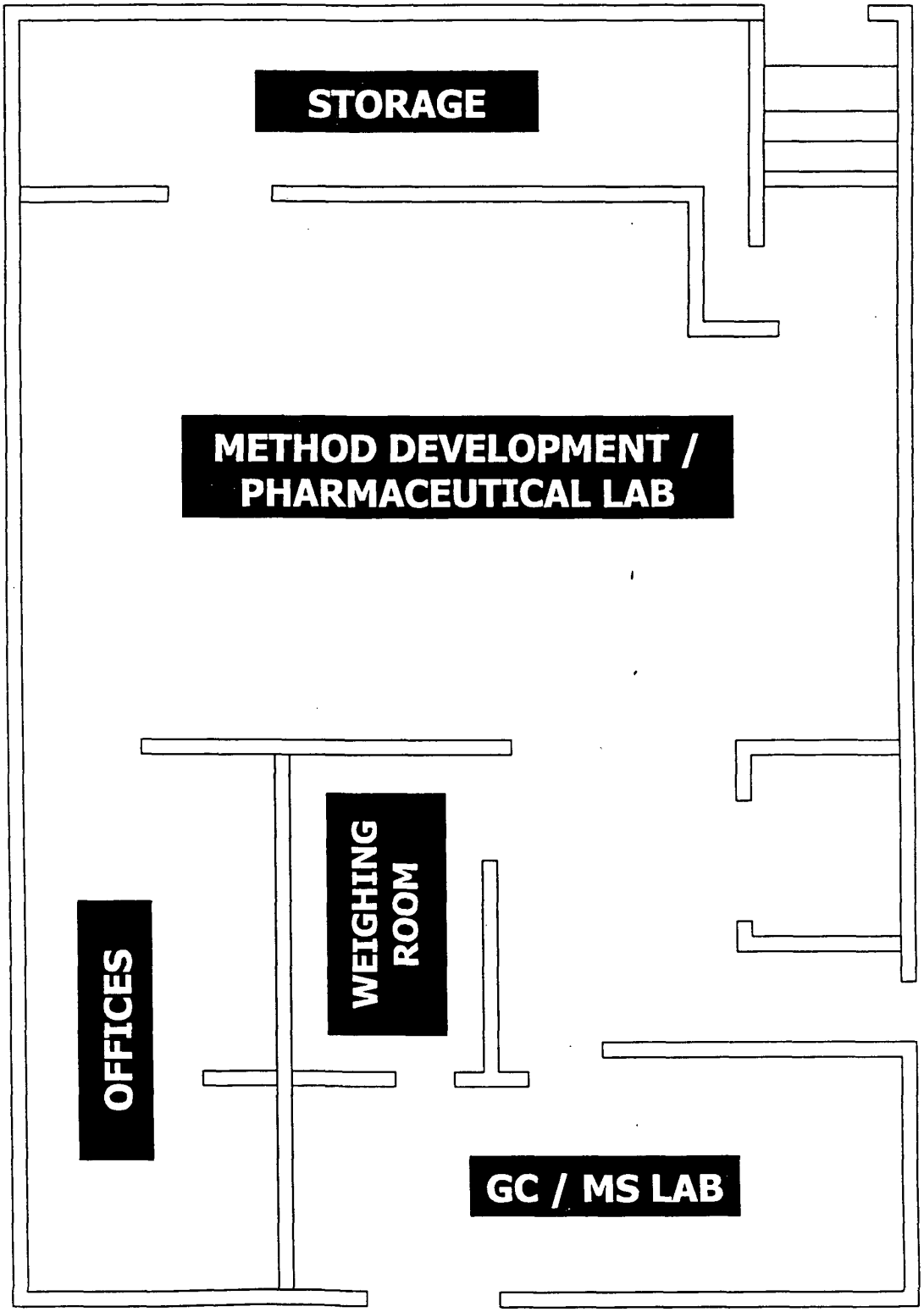
UNIT D



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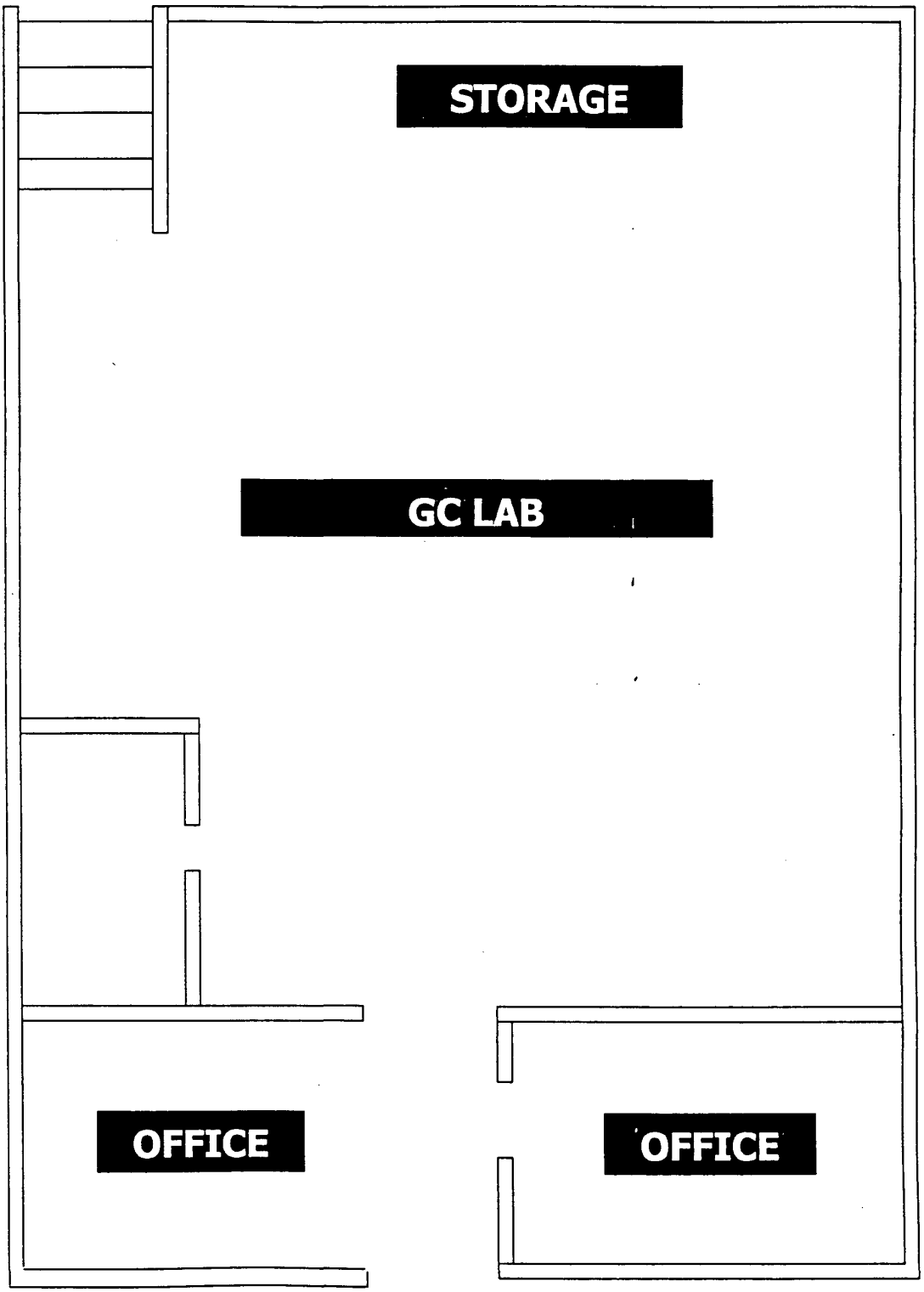
UNIT E



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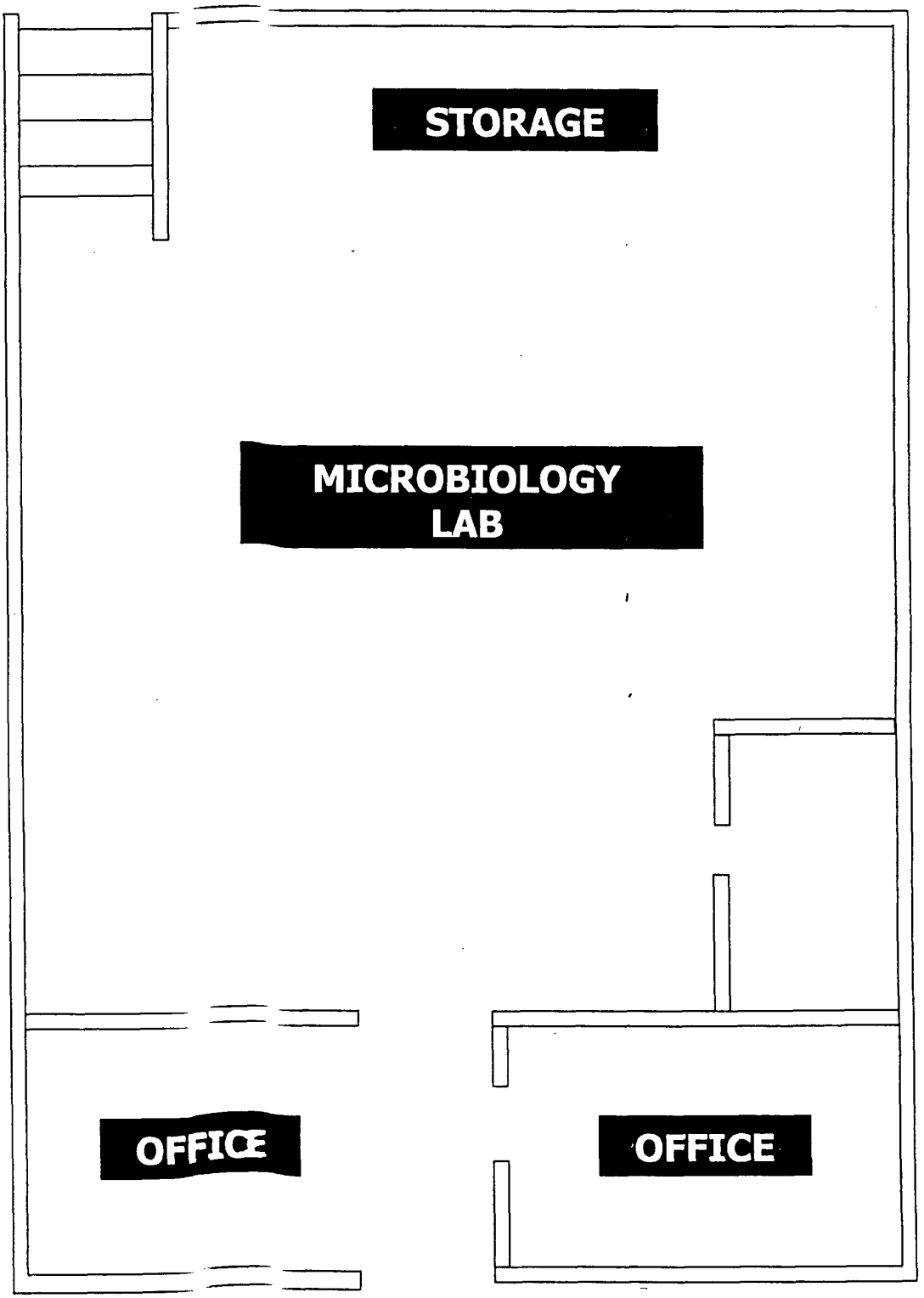
UNIT F



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Sample Integrity

The aim of preserving environmental samples is to retard chemical and biological changes that would inevitably continue after sample collection. IAL has a complete stock of pre-cleaned sample jars and bottles. These bottles are available on the day of sampling, preserved for the specific analysis requested.

Abusive handling or faulty packaging of a sample can be one of the many reasons why physical damage can occur. The Sample Custodian inspects samples upon receipt at the laboratory. Should the samples be compromised in some way, IAL will contact the client for a decision regarding the analysis of the samples.

In special requested circumstances, coolers can be supplied with chain of custody seals. The client in the field attaches these seals to the cooler. This prevents tampering of the samples during transit. Once the samples reach the laboratory, the seal is broken and the Sample Custodian visually inspects the samples.

- **Sample Identification/Information**

Accurate sample identification is a basic requirement for sample integrity. Inadequate, ambiguous, or non-existent labeling of the samples will result in an automatic hold on all analyses requested. Sample identification must be fairly obvious and accurately related to the chain of custody.

- **Forms**

Integrated Analytical Laboratories, LLC has created several forms to aid in scheduling and monitoring client's projects. These forms include three-part IAL Chain of Custody Forms, three-part IAL Glassware Order Forms, IAL Expedited Turnaround Time Forms, Sample Receipt Verification Forms, In-house Chain of Custody Forms and Laboratory Custody Chronicle Forms. Some of these forms are required by federal and state agencies.

Sample Receipt

Samples are received at the IAL Sample Receiving Area, Unit 9, 273 Franklin Road, Randolph, NJ 07869. Samples are received by the IAL Log-in Staff under the supervision of the Sample Custodian. The Log-In staff is trained to handle and document the samples and oversee the proper storage and handling of samples throughout the laboratory.

Upon arrival at the lab, the log-in staff member examines the sample container and sample bottles for their physical integrity (i.e. custody seals intact, bottles and container not damaged, etc.). The log-in staff verifies the condition of the received samples and the Chain of Custody (COC) based on the following information:

a. Sample number on COC matches bottle label
b. Sampling date and time
c. Sample matrix
d. Analyses required
e. Number of containers for each sample
f. Sufficient sample volume
g. Proper preservative/s used and verified
h. Cooler temperature upon receipt at the laboratory
i. Samples received within holding time
j. Date and time the custody of the samples were transferred to the lab
k. Deliverables requirement
l. Verbal and hard copy due dates

The Log-In staff assigns an IAL Lab Case Number to reference each document and insure data reporting uniformity. The Lab Case Number and sample information is input into a preliminary Log-In program in the sample receiving area. This information is used to generate specific sample bottle labels for each of the sample bottles received at the lab. Each bottle label contains the sample ID number, the analysis to be performed on the sample jar and the number of jars received for this sample number. The label is bar-coded containing the relevant sample information. Eventually all samples will be monitored throughout the lab by the bar-coded label.

Sample Handling and Custody - *continued*

- **Sample Receipt** - *continued*

Sample Receipt Verification Form (SVRF): The sample condition is verified to meet the NJDEP Field Sampling Protocol and/or EPA preservation requirements and the information is documented on the Sample Receipt Verification Form (SVRF). The following conditions will also be reported on the SVRF:

- Sufficient sample volume
- Headspace in sample containers designated for volatile organics
- Proper sample preservation (including checking the pH of the sample)
- Cooler temperature upon receipt at the laboratory

Any nonconformance will be noted on the SVRF and the Sample Log-in Officer will be notified. The COC and the SVRF are given to the Sample Log-in Officer to input the information into the laboratory computer system and deal with any problems, etc.

The IAL Sample Custodian receives the samples and documents sample integrity. The two following custody related steps occur in the sample receipt procedure and care is taken to document them properly.

A. Transfer of the samples to the laboratory by use of a common carrier is documented on the COC form. The shipping documents become part of the permanent project file.

B. The Sample Custodian is responsible for maintaining custody of the samples during the login and distribution processes and for assuring that all records documenting that possession are properly completed.

Primary factors such as sample temperature and record of preservation are checked upon receipt. Proper sampling and preservation in the field is the responsibility of the client. The IAL Chain of Custody/Analysis Request Form contains a sampling validation statement for the sampler to initial, thereby verifying that proper sampling and preservation was carried out.

Sample Receiving Documentation

The primary custody elements, which are completed and retained, are as follows:

A. Chain of Custody/Analysis Request Form
B. Shipping documents, for example the bill of lading or air bill; and
C. Internal Chain of Custody Record.

All client samples analyzed by IAL are handled as if they are of an evidentiary nature. The possession of samples must be traceable from the time samples are collected in the field until the analysis is completed and samples are discarded.

Custody is defined as:

A. In actual physical possession;
B. In view after being in physical possession;
C. In a locked area after being in physical possession; and
D. In a designated, locked storage area.

IAL provides sample labels and a Chain of Custody (COC)/Analysis Request Form for use by clients.

The COC and all other forms used to document the proper handling of the samples contain a location(s) for appropriate signatures. All individuals who have custody of the sample are required to sign and date the forms in ink.

- **Sample Identification**

Every sample container received by IAL and every sample generated by sub-sampling in order to allow different analyses to be performed on the same sample are individually identified by an IAL sample number as follows:

E00-4215-001-01

Where:
E00 = the year the samples were received at IAL
4215 = the sequential number given to the project
001 = sequential number (001 to 999) identifying each client sample in the project
01 = a sequential number (01, 02, 03...) which identifies each replicate sample container for each client sample in the project.

Sample Tracking and Management

IAL maintains sample information records in a Laboratory Information Computer System. This chronological record contains all samples received or generated by sub-sampling in order to allow a single sample to be analyzed by different analyses. All identifying information and cross-referencing data described above are maintained in the computer for tracking purposes.

Any sample sets, which have special handling or urgent analysis or holding time requirements, are immediately recorded into the computer system, assuring that all projects are handled and completed as requested by the client or required by the circumstances. Project folders, which have a special handling status, are color-coded.

- **Laboratory Custody Chronicle (LCC)**

The Sample Log-in Officer generates the Laboratory Custody Chronicle (LCC) form for every project received by IAL. The LCC is designed to monitor the whereabouts and identify the personnel who have handled each sample and/or extract.

The Sample Custodian is responsible for the distribution of samples throughout the laboratory and maintaining the LCC.

The Sample Custodian will relinquish and sign over the custody of the samples to the analysts only after the analysts has signed the LCC. The date and time of analysis performed on the sample must be documented. When the analyst has completed the required tests on the sample, he/she will relinquish it back to the Sample Custodian.

If the sample requires sample preparation, the Sample Custodian will transfer the samples from the refrigerator to the Wet Chemistry Laboratory with the corresponding LCCs. Custody is transferred to the Wet Chemistry department and the LCCs signed by the Wet Chemistry staff with the date and time of sample preparation. Because of the sample preparation, a sample extract or digestate is generated. The extracts or digestates are given to the analyst and stored in designated refrigerators until analysis is performed.

- **Confidentiality**

To ensure the agreements of confidentiality that IAL has with its clients, all employees are required to sign a confidentiality statement at the beginning of their employment. This statement explains the ethical and legal responsibilities of an IAL employee as well as procedures to insure confidentiality.

The following items are covered by the IAL Confidentiality Policy:

1) No client's name, person's name, company's name, or site location will be written on correspondence or be verbally transmitted in reference to a particular project except to the client, persons named on the Chain of Custody (COC)/Analysis Request Form, or their designated representative.
2) Any request for analytical data or project information by anyone, other than those noted on the COC/Analysis Request Form will not be fulfilled without a written release by one of the people so designated.
3) Information not on the COC/Analysis Request Form associated with a specific work order will not be incorporated into an analytical report, except by instruction in writing by the client or the client's designated representative.

- **Ethics Program**

IAL requires all company employees to participate in the IAL Ethics Program. As an environmental laboratory committed to bringing the best quality data to our clients, the practice of fraud at IAL is unacceptable.

Quality requirements are strictly enforced. Analysts and technicians must adhere to the strict protocol as established in the analytical methods set forth by the accrediting authority. IAL employees understand the difference between making a mistake and improper behavior. Any observation of suspicious, unethical, or illegal behavior is the employee responsibility to report.

IAL Principles of Ethical Behavior

1) ***Honesty*** – We will not say or report things which are false. We will not deliberately report misleading data.
2) ***Promise Keeping*** – We will go to great lengths to keep our commitments. We will not make promises that cannot be kept and we will not make promises on behalf of IAL unless we have the authority to do so.
3) ***Integrity*** - We will live up to our ethical principles, even when confronted by personal, professional and social risks, as well as economic pressures.

Security of Project Data and Samples

Confidentiality and security are controlled with the following security items:

1) All visitors must sign in upon arrival and a member of the staff escorts them while inside the facility.
2) Sample storage refrigerators, freezers, or the rooms containing them and data storage areas are kept locked when not supervised.
3) Samples will remain in locked sample storage areas until removed for sample preparation or analysis. Each supervisor maintains a list of the location of all sample storage area keys or maintains personal possession of them.
4) Only the Sample Custodian and supervisory personnel have keys to the sample storage areas.
5) Managers are responsible for knowing which employees are in the building after hours.
6) Facility keys are issued to management personnel. The Office Manager maintains documentation of receipt of a key on file. Other employees may receive facility keys if so requested by the department manager. All keys are coded as facility specific and cannot be duplicated.

Sample Storage, Access, Temperature and Thermometer Calibration

Samples are stored in locked refrigerators in the sample receiving/log-in area. Only specific IAL laboratory personnel have access to the storage refrigerators. Volatile samples and Semivolatile extracts are stored in separate refrigerators to prevent cross contamination.

Samples are stored in the refrigerators at 4°C (1°-6°C) and protected from light. Refrigerator temperatures are monitored and recorded twice daily in the Temperature logbook. Each refrigerator has a dedicated thermometer used for temperature monitoring. The tip of the thermometer is submersed in deionized water in a flask. The thermometer and flask are stored in the refrigerator at all times to allow observation of the temperatures periodically over the course of the day. This enables the Sample Custodian to detect any problems sooner than the documented daily inspection. If the temperature is not within the required range, it is adjusted and noted in the logbook. If the temperature is unable to be maintained, the Department Manager or Laboratory Director is notified and corrective action is taken.

If the refrigerator temperature is found to be outside of the acceptable range, the Sample Custodian will immediately notify the General Chemistry Manager and the Lab Director. The Lab Director will contact the on-call refrigeration repair service to request for immediate repairs. The General Chemistry Manager will closely monitor the situation. Dry ice will be brought in as needed. If necessary, samples will be removed to another refrigerated storage area.

Refrigerator thermometers are calibrated semi-annually against NIST thermometers.

Sample Disposal

Sample disposal is performed about every 6 to 8 weeks, depending on the volume of samples in-house. IAL retains client samples as long as possible until storage facilities become compromised. The samples will not be disposed of if the final hardcopy report has not yet gone out, if any samples are still on hold in the project, or if a client has requested the samples be stored until notified.

When it is necessary to dispose of samples, the QA Officer is notified. The QA Officer will determine the samples, which can be discarded, and the ones that need to be retained. The disposal facility will be notified and a waste pick up will be arranged.

Samples are disposed of according to the type of waste it contains. IAL maintains certified waste stream disposal for the materials encountered in routine environmental samples.

All waste disposal is performed in strictest compliance with New Jersey regulations. All waste disposal records are retained in the QA office and available for review as needed. "Hot" or extremely hazardous samples are segregated from the routine samples and disposed of according to proper protocol, i.e. lab pack, etc. or samples will be returned to the client.

IAL maintains a specific waste storage area to control the waste material.

Calibration Procedures

Calibration tolerances are specific to the analytical methods used for regulatory purposes. Specific procedures for individual instruments and analytical methods are not delineated in this document. Two types of calibrations are discussed - operational and periodic. Operational calibrations are carried out routinely as part of instrument usage. The operational calibration program involves initial calibration, QC check samples, and continuing calibration verification. Periodic calibrations are a distinct process carried out for general-purpose equipment, such as analytical balances.

- **Instrument Calibration**

Instrument calibration is performed in accordance with the strict requirements of the methods of analysis. Initial instrument calibration will be carried out according to acceptable criteria. Continuing calibrations will be performed to confirm the validity of the initial calibration. The number of calibration standards used for a specific analysis is determined by the method. A minimum of two calibration standards will be used if not indicated in the analysis method. The initial calibration will contain standard concentrations above the instrument detection levels and in the working range of the samples being analyzed or as specified by the analytical method. All initial calibration procedures are designated in the Standard Operating Procedure (SOP) written for the analysis.

- **Operational Calibration Records**

A bound notebook is kept for each piece of equipment. This notebook contains a record of each analysis, calibration, sample analysis and QC performed. Each of the following is assembled chronologically by instrument and stored together as a laboratory working record or entered in its entirety into the instrument notebook:

1) Calibration data;
2) Calibration verification data; and
3) Method blank data.

Calibration Procedures - *continued*

- **Calibration Reference Materials**

Calibration reference materials for organic analysis are a minimum 97% pure and purchased from a reputable supplier. Reference materials used to generate quality control samples (used to verify calibrations) are from a source independent of the calibration standards, or if not available from a reliable independent source, are from stock standards prepared separately from calibration standards.

Low parts per billion (ppb) level calibration standards for metals are prepared fresh daily with dilutions of parts per million (ppm) level standards. These stock standards are prepared by dilution of commercially available 1000-ppm stock solutions. Standards from a source independent from the calibration standards are used for initial calibration verification.

Records of the source of the calibration standards and QC reference materials are maintained.

Purchased stock standards are documented with certificates of analysis to insure material purity. IAL uses and reports not only calibration standards but an alternate source standard as well.

- **Standards Preparation**

Standards are prepared as specified in the respective analytical methods. In order to assure the accuracy of standards the following guidelines are used:

A. The best available solvent is used
B. ACS reagent grade or better chemicals are used
C. Only Class A volumetric glassware are used
D. Only properly calibrated balances, pipettors and other general laboratory equipment are used
E. Only properly trained technicians, following established operating guidelines will handle and prepare standards.

Calibration Procedures - *continued*

- **Generation and Acceptance of a Standard Curve**

A standard calibration curve is the analysis of a series of standard solutions over a concentration range appropriate for the samples. The standard curve is a plot of the instrument response versus the known concentration. The number and concentration of calibration standards required is specific to the method and is given in the method SOP. A minimum of three standards is necessary to demonstrate linearity.

The essential characteristics evaluated for acceptance of the curve are as follows:

A. The degree of variation of the response factor with concentration (i.e. curvature)
B. The working range of the curve
C. The consistency of the response factor with past experience
D. The sensitivity of the response as it relates to detection limit and system performance
E. The blank bias

Measurement Traceability and Calibration

Calibrations are performed using traceable materials and mixtures. IAL purchases materials and mixtures from manufacturers capable of supplying certificates of analysis for each product. These certificates are retained by IAL. Subsequent calibration standards are verified by comparison with second-source materials. Each standard is given a unique identification number. The unique identification number is used to trace each reported analytical result through the initial calibration curve used to calculate that result, and back to the original purchased standard establishing an unbroken chain of comparison

IAL has a strict protocol for maintaining the equipment used to produce valid and accurate results. It is a duel approach with requirements for the analytical support equipment as well as the requirements for instrument calibration.

ANALYTICAL SUPPORT EQUIPMENT

Any equipment found to be performing outside of specification would be removed from use immediately. All calibration procedures are documented and recorded as having been performed.

All refrigerators and cold storage units are monitored and checked for temperature on a daily basis. All ovens, incubators and water baths are temperature checked daily; as well as daily monitoring of the fume hoods. All balances are calibrated daily against Class S weights. Servicing by an outside company is performed every year.

Measurement Traceability and Calibration – *continued*

All thermometers used in the facility are calibrated against NIST certified thermometers in the temperature range used, at least every six months. The TCLP rotator is checked every six months. Class A glassware will be used as required.

Every day a sample is analyzed, an initial calibration or continuing calibration verification must be performed. An initial calibration is usually performed at least on a monthly (30 days) basis. Some initial calibrations can maintain validity for a longer period while some require to be performed more frequently.
Samples not analyzed following an initial calibration curve must be preceded by continuing calibration verification. All continuing calibration procedures are designated in the Standard Operating Procedure (SOP) written for the analysis. Continuing calibrations will be performed to acceptable criteria as indicated in the method and the IAL SOP.

If the results of an initial calibration curve or a continuing calibration are outside acceptable criteria, no samples will be analyzed. Corrective action will take place and calibrations will be re-analyzed before samples are run.

Standard operating procedures for analytical methods performed by IAL include acceptance criteria for calibrations. If acceptance criteria differ between analytical method and regulation, IAL conforms to the more stringent set of applicable criteria. IAL standard operating procedures also include documentation of all laboratory procedures contributing to analytical results, in order that the events leading to each result can be reconstructed in detail.

Equipment is verified upon receipt and subject to annual checks over the entire range of use. Measurements are traceable to NIST standards (e.g. temperature, volume, and weight). NIST traceable standard equipment is used for the purpose of calibration only. Certificates for this equipment are retained by IAL. Procedures for the maintenance and verification of measuring equipment are established in IAL SOPs.

Personnel must submit demonstrations of capability before generating reportable sample results. These tests include four replicate analyses in order that the variance of the results can be statistically established as within IAL criteria.

Report Generation

The analytical procedures used by the laboratory fulfill the precision and accuracy objectives, as required.

- **Data Deliverable Reports**

Integrated Analytical Laboratories, LLC offers several different data report deliverable packages to accommodate requirements set forth by our clients and various regulating agencies. Reports can be produced as Results Only, NJDEP Reduced Deliverables, NJDEP Regulatory Deliverables, NY ASP -A and -B. The specifications for the New Jersey deliverable requirements can be found in NJAC 7:26E – Appendix A. New York specifications can be found in the NYDEC Analytical Services Protocol.

- **Documentation Reported**

A "Results Only" laboratory data deliverable report contains, at a minimum, the following information:

1) Identification of the laboratory
2) IAL sample ID number
3) Client sample identification
4) Date sampled
5) Date analyzed
6) Date of extraction, if applicable to the verification of sample integrity
7) The name(s) (first initial, last initial) of the analyst(s) performing the analysis, if required
8) Parameters measured
9) Units in which each parameter is reported
10) Minimum Detection limits
11) A copy of all original documentation received with the samples

Reporting limits referred to as Method Detection Limits (MDLs), which are above the Instrument Detection Limits (IDLs), are utilized in the IAL data reports.

Report Generation – *continued*

- **Report Revisions**

For all report revisions and reissues involving a change in data, the revised/reissued reports are labeled accordingly and the date of the previous revision is referenced. The Quality Assurance Officer or designee reviews all reissues involving a change in data. A written justification for the change is included in the project file and sent to the client if necessary.

- **Records Retention**

All data information required to reproduce the analytical results including instrument raw data, prep logs, worksheets, copies of hardcopy data output and other project records are stored together in a secure location. Final data reports are scanned onto a computer CD-ROM before being released to the client. The laboratory retains all project information for a period of not less than five years.

- **Report QA Deliverables**

The standard analytical report includes no quality control documentation. However, all QC requirements are met. The elements of reports for clients needing quality control documentation are determined by the application. Some types of client required QC deliverables have elements similar to other packages, but the specific requirements should be determined before the initiation of sampling and analysis. Certain projects under regulatory review require establishment of explicit quality assurance objectives. The laboratory technical and quality assurance staff provide any information required establishing and documenting achievement of the quality assurance objectives for particular projects.

- **Microbiological Action Response**

Action Response to Microbiological Sample Results

- Whenever a sample result exceeds the regulatory limit the Department Supervisor notifies the Customer Service Department, who immediately calls the client to arrange for resample(s). This is done on the basis of unverified MF coliform or MPN confirmed results.

- Whenever the laboratory determines the presence of fecal coliform in a drinking water sample the Department Supervisor notifies the Customer Service Department. The Customer Service Department immediately (within 24 hours) notifies either the water purveyor and the municipal health agency (for non-transient non-community and transient non-community water systems) or the water system's superintendent and the NJDEP Bureau of Safe Drinking Water (for community water systems).

- Every effort is taken by the department to eliminate the occurrence of false negative results. Positive controls are routinely analyzed, along with media comparisons between different lots, maintaining strict temperature controls and confirming "stressed" organisms in drinking water samples.

Report Generation – *continued*

- **Microbiological Action Response - continued**

Action Response to Microbiological QC Problems

QC response depends on the problem encountered. For example:

1) If any membrane filter sterility check indicates contamination, all of the data on the samples affected is rejected and a resample is requested.
2) Discard any batch of rinse water failing the sterility test (BHI).
3) If any sample bottle fails the sterility test, the bottles are rejected and returned to the manufacturer.
4) If Kilit ampules display any growth, the associated batch of media is discarded.
5) Any lot of membrane filters failing the recovery/performance test is rejected.
6) Any controls showing an incorrect result causes rejection of sample being tested and a resample of all work.
7) Analyze all media with a known positive and negative control. Discard any batch of media that fails the appropriate QC checks.

NOTE: *The Department Manager and QA Officer address all QC problems to determine the cause and corrective action indicated to prevent future occurrences. If the cause is not readily apparent, the problem is discussed with Quality Assurance Officer and the Laboratory Director and a course of action is decided upon.*

For Non-Community Systems - Ground Water Serving < 1,000 people - If the Maximum Contaminate Level has been exceeded for bacteria, the Bureau of Safe Drinking Water (609) 292-5550 must be notified by the end of the next business day and a Public Notification must be issued within 14 days.

An acute MCL occurs when:
A routine sample tests positive for E. coli or Fecal Coliform and the repeat sample tests positive for Total Coliform. Or a repeat sample tests positive for E. coli or Fecal Coliform.

The Bureau of Safe Drinking Water (609) 292-5550 must be notified before the end of the same business day, or by the end of the next business day if the detection occurs after the close of business for the state, and a Public Notification and a Public Notification must be issued.

Quality Control and Data Validation

Data validation is an integral part of Integrated Analytical Laboratories, LLC QA/QC program. Data validation is performed on all analytical data report packages by qualified QC Coordinators. Each QC Coordinator is required to become familiar with every analytical testing method used at IAL.

Data is reviewed by the QC Coordinator to verify that all client requirements have been fulfilled. Verification is also performed on method requirements, reporting agency requirements and data deliverable requirements. The internal quality control checks routinely implemented by the laboratory are described in this section. This outline includes the minimum required degree of effort (the amount of quality control samples expressed as a percentage of the total number of client samples), and the control limits applied to maintain method control.

- **QC Frequency**

The required frequency of QC samples is a function of the particular method, the particular regulatory program under which the results will be evaluated, or the particular contract requirements.

- **Quality Control Program Elements**

The quality control program element cover both instrument and method quality control. The frequency of instrument control checks is based on the analytical batch as introduced to the instrument. For example, QC check samples and mid-range standards used for instrument calibration verification may be specified by certain methods to be introduced at the beginning, after every ten samples, and at the end of an analytical run. The frequency of method control checks, on the other hand, is based on the analytical batch as handled in the sample preparation, digestion, or extraction process.

The analytical batch is determined according to requirements of no more than 20 samples of the same or similar matrix. The method quality control samples will be selected from this batch. The minimum number of matrix spikes and laboratory duplicates associated with the samples for a batch are one per analytical batch per matrix.

The control limits for instrument control are set at levels published in the source method, or by laboratory practice if an authoritative source is not available. These tolerances for instrument operation are absolute and are not to be abrogated without the approval of the Laboratory Director and the Quality Assurance Officer. For method control elements (blank, matrix spike, laboratory duplicate or matrix spike duplicate, surrogate spike, laboratory control sample, QC check sample, and method detection limit) statistical evaluation is often the source for the control limits.

Quality Control and Data Validation - *continued*

- **Method Detection Limit**

The method detection limit (MDL) is determined for all analyses annually. As the blank acceptance criteria are affected by the MDL, it is critical that the detection limit study be performed properly and regularly.

Audits

Audits measure laboratory performance and insure compliance with certification programs. There are five main types of audits: internal, external, system, report, and blind sample audits.

- **Internal Audits**

The QA Officer or a designated alternate will, at a minimum of once per year perform a laboratory audit. A complete checklist similar in format to a state audit will be performed to verify that IAL's laboratory operations will continue to comply with the requirements of the quality system. Findings of the audit will be discussed during the monthly management meeting immediately following the completion of the audit. Department managers will be required to correct any deficiencies prior to the next meeting. If any deficiency noted could impact the correctness or validity of the calibrations or test results, IAL will take immediate corrective action. The QA Officer shall notify any client, in writing, which may have been affected by the findings.

- **External Audits**

External audits are performed when certifying agencies or clients submit samples for analysis and/or conduct on-site inspections. It is IAL's policy to cooperate fully with certifying agencies. It is also IAL's policy to comply fully with system audits conducted by regulatory agencies and clients. The laboratory is involved in external performance audits conducted semi-annually by the evaluation of performance testing samples as required by NELAC certification. Additional performance audits are conducted as required by clients and state certifying agencies.

Audits - *continued*

- **Systems Audits**

Systems audits evaluate procedures and documentation in the laboratory. Systems audits encompass all aspects of the analysis, checking for adherence to criteria in this QA plan and in the method SOP. As a minimum, items covered are sample custody, calibration history, quality control, instrument control, data reduction and validation, method start-up QC, and records. Representative analytical projects are reviewed from inception to completion.

- **Report Audits**

Report audits, which evaluate the correctness and appearance of the laboratory reports, are performed routinely by the QA Department. Analytical reports are audited at a rate of 95% ± 5%.

- **Blind Sample Audits**

Blind sample audits are performed by submitting a sample of known characteristics through ordinary sample handling procedures and comparing the reported concentrations with the known values.

Preventative Maintenance

The objective of preventative maintenance is to produce stability and predictability in the laboratory operation. It is a management tool, which has a direct bearing on the efficiency and productivity of the laboratory. Preventative maintenance procedures are specified in each method SOP.

- **Instrument Maintenance**

A strict schedule of instrument maintenance is adhered to at IAL. All equipment preventative maintenance procedures are documented and detailed in the IAL SOP file, Chapter 2. SOP's are present for the maintenance of IAL instrumentation. Instrument logs for all maintenance procedures are kept in the department where the instrument is located. Qualified technicians, usually the department manager or the manufacturer's representative, perform maintenance and repairs.

Procedures to Assess Data Quality

The procedures and formulas required to assess data quality and overall method performance are described in this section.

- **Precision**

The precision of laboratory test results will be expressed as the percent relative standard deviation (% RSD) or relative percent difference (RPD). RPD is derived from the absolute difference between duplicate results, D1 and D2, divided by the mean value of the duplicates.

$$RPD = \frac{(D_1 - D_2)}{(D_1 + D_2)/2} \times 100$$

- **Accuracy**

Accuracy for the laboratory is expressed as the average percent recovery of spiked samples.

$$\%R = \frac{SSR - SR}{SA} \times 100$$

Where:
%R = % Recovery
SSR = spiked sample result
SR = sample result
SA = amount of spike

- **Representativeness**

Representativeness is evaluated by comparison of duplicate analyses and by the results of audits, which establish that the procedures to protect the integrity of samples are being followed.

- **Completeness**

Completeness is evaluated by dividing the total number of verifiable data points by the maximum number of data points possible and expressing the ratio as a percent.

Procedures to Assess Data Quality - *continued*

- **Comparability**

Comparability is evaluated for most of the common analyses in the inter-laboratory performance evaluations. The EPA, state agencies, and IAL clients typically carry out these evaluations. Split samples are another form of inter-laboratory study carried out by IAL clients. This information is in the form of accuracy and precision statements, detection limit study results, and summaries of specified variations of standard methods found in the individual method SOP's used in the laboratory.

- **Detection Limit**

For methods operating under this document, the Method Detection Limit (MDL) is defined according to Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 1, and December 1987.
"The minimum concentration that can be measured and reported with 99% confidence that the value is above zero."

It is approximately 3 times the standard deviation of a set of seven replicates at a concentration very near (within 5 times) the detection limit. The MDL is used to judge the significance of a single measurement of a future sample, and defines a limit above which false positives are very unlikely.

- **Method Control**

Method control is based on published EPA performance criteria, on a statistical evaluation of quality control results or on provisional limits set while statistical evaluation is pending. Method control is documented as a quality control chart or tabulation. In certain instances where the method explicitly references a control limit, the referenced control limit is used unless the evaluation of the statistical control indicates that laboratory performance is significantly better than the referenced limit. As a minimum, IAL maintains control charts or tabulations for matrix spikes for accuracy, and either duplicate matrix spikes or duplicate samples for precision.

Corrective Action

When problems or situations arise due to instrument malfunctions, procedural changes, high sample concentrations resulting in contamination, or any other factors, a problem resolution system has been established.

When an Analyst is presented with a situation deviating from the norm, he/she is required to initially determine the cause and possible rectification of the problem (i.e.: instrument recalibration, standards preparation, dirty glassware, etc.). If the situation could cause a deviation from established standard operating procedures, the Analyst is required to inform the Department Manager.

The Department Manager will establish the best course of action resulting from the information. If the Department Manager cannot establish a course of action within the guidelines of the standard operating procedures, he/she will consult with a QA Coordinator.

The QA Coordinator will if necessary, research the corrective action deemed necessary for the situation. Upon completion of information gathering, the QA Coordinator will discuss the situation with the Department Manager and determine a course of action.

Occasionally a situation may present itself that would need a more intensive evaluation. Under these circumstances, the QA Coordinator and Department Manager would meet with the Quality Assurance Officer and Laboratory Director to decide the best conclusion to the situation.

Any changes to the standard procedures are discussed and instituted only after full review by the QA Officer, Laboratory Director, Department Managers and appropriate personnel prior to implementation. All concerned personnel are notified in writing of all changes approved by the applicable personnel.

Any procedural changes or non-conformances would be carefully documented in a case summary for the project.

The QA Officer has the responsibility of responding to and addressing all quality assurance situations that may arise.

This person will discuss and provide feedback on all quality assurance issues to the appropriate personnel as well as the Laboratory Director.

Corrective Action - *continued*

The QA Officer will provide notification to personnel of the results pertaining to all PE analyses, internal and external audits and any problems found in the data review process.

The QA Officer will maintain status reports and documentation of PE results, audits and QA procedural changes for a summary presentation to the company president on a periodic basis.

Internal QA Inspection/Corrective Action Procedures

To ensure the reliability and accuracy of the produced data, IAL has placed several systems into effect under the guidance of the predetermined analysis methods.

- **Specific Instrument QC**

As required by 40 CFR and SW-846:

Tuning criteria
Instrument Calibration criteria
Quality Control Check Sample criteria
Reagent (Method) Blank criteria
Surrogate/Analyte Recovery criteria
Matrix Spike and Matrix Spike Duplicates
Method Accuracy Studies: regular assessment studies (Shewhart Charts)
Internal Standard Area and Retention Time Monitoring (for GC/MS analyses)
Precision and Accuracy Studies

- **Documentation Procedures**

As required by SW-846, NJDEP deliverables:

Chains of Custody
Sample Receipt Verification Forms
Analysis Request Forms
Bottle/ Sampling Orders
Laboratory Notebooks (bound and paginated)
Reporting Forms (bound and paginated)

Internal QA Inspection/Corrective Action Procedures - *continued*

- **Data Review & Validation**

As required by SW-846, 40 CFR, Standard Methods for the Examination of Water and Wastewater

A standardized system of data review and validation has been implemented by IAL to assure the accuracy and validity of the processed data.

- **Quality Assurance**

As required for state certifications and in-house evaluation procedures, Standard Methods for the Examination of Water and Wastewater

Performance Evaluation Studies: participate in PE studies as required by NELAC at a minimum of 2 times per year.

Method Blank Monitoring: blank data is kept on file to evaluate reagent-free water status over a long-term period.

Internal Audits: annual internal audits performed by the QA Officer or designee to verify compliance with all established standard operating procedures.

External Audits: participate in the audits by the NJDEP for NELAC certification as well as client on-site evaluations.

- **Procedures for Controlling, Estimating and Correcting Data Errors**

Integrated Analytical Laboratories, LLC (IAL) takes every effort to minimize data errors within sample analyses, results reporting and document control. The following is a list of procedures used in order to achieve this goal.

1) Shewhart Charts are used to establish and maintain upper and lower control limits.
2) Method blanks are prepared and analyzed for each set of samples extracted or digested.
3) Quality Control samples are analyzed with all parameters to ensure accuracy.
4) Matrix Spike and Matrix Spike Duplicate samples are analyzed at a minimum of every 10 - 20% of samples in order to ensure precision.

Internal QA Inspection/Corrective Action Procedures - *continued*

- **Procedures for Controlling, Estimating and Correcting Data Errors** – *continued*

1) In-house "Blind" samples are introduced into the system by the Quality Assurance department. These samples have values known only to the QA department. Once samples have been analyzed, the results are submitted to the QA Department for review. The QA compares the results submitted to the true values, and notifies the appropriate department managers if any errors or potential problems exist.
2) Proficiency Evaluation Samples are analyzed at a minimum of two times per year as well as other evaluation samples required for special service certifications.

- **System Checks**

A system of checks is used to evaluate the data prior to sending it to the client. The analyst, to assure procedural and client requirements have been met, reviews all data prior to submittal to the department supervisor. The department supervisor performs an overview of the data, prior to submission to the Report Generation Department. After the report is generated, the Quality Control Department reviews the report in its entirety. If any errors are detected in the data, the QC Department will confirm or revise the report as necessary. The Laboratory Director performs a brief overview of the report. At this point, he will sign the report package for release to the client.

- **Procedure for Tracking Analytical Data**

IAL maintains two types of Data Tracking Systems on in-house projects.

1) Computer Systems:
   a. An Intranet System is available on all IAL computers connected to a central file system. Until a hardcopy of the project tracking system is available for distribution, employees can access the Intranet to view new project information.
   b. A Sample Tracking system is also available through the central file system, which can be accessed from any IAL computer. As projects are revised and updated with new client information, this program is automatically changed to keep employees aware of the situation.

Internal QA Inspection/Corrective Action Procedures - *continued*

- **Procedure for Tracking Analytical Data - continued**
  1) Data Traveler Sheets:
     a. Data Traveler Sheets are generated for each department for each project for every sample received at IAL. These traveler sheets serve as a hard copy for the project tracking mechanism. The Data Traveler Sheets contain all of the essential information needed to complete a client project. The following information is contained on these sheets:
        1) IAL Lab Case Number
        2) IAL Sample ID Numbers
        3) Client Information
        4) Client Sample Information
        5) Date Received
        6) Date Results due
        7) Parameter (s) to be analyzed
        8) Notes, Comments and Special Client Information

Upon arrival into the department, the information is logged onto the department Log-In Sheet. The Log-In Sheet serves as a progress record for the samples and as an updating device for the Tracking Sheets.
All departments use the Data Traveler Sheets in order to unify the data tracking system. When the project is complete, the data is reviewed by the department manager and submitted to the Report Generation department.

- **Document Control System**

The Document Control System used by Integrated Analytical Laboratories is a simple, effective procedure of assigning each item a control number, a revision number, and a revision date. The following Control Numbers are used for IAL documents:

IALQAM	QA Manual
IALSOP	Standard Operation Procedure
IALSOQ	Statement of Qualifications

In addition, all QA Manuals and Standard Operating Procedures (SOPs) are signed at a minimum by the Laboratory Director and the QA Officer. The author also signs their respective SOPs. Every time a change of any kind is made, the revision number and revision date are documented.
Example:

IALSOP1.08
Rev 03
07-Apr-00

Internal QA Inspection/Corrective Action Procedures - *continued*

- **Procedure for insuring security of database**

All raw data from each analytical department is stored on a back up system, which consists of magnetic tape, floppy disks or hard copy. All of these back up systems are stored in a locked storage facility equipped with smoke detectors and a fire extinguishing system. All documents in the report generation system are archived on floppy disks for storage and recovery in the event of a system failure.
All departments back up their information at least once every 24 hours. Two copies of the backed up data are retained. One copy is kept in the department, while the manager or the MIS department retains the other.

The corrective action scheme for investigating suspected data quality problems is presented in this section. The means by which the laboratory discovers, tracks, and completes the investigation of problems is discussed.

- **Initiation and Completion of Corrective Action**

The investigation of suspected data quality problems is initiated consequently of quality control criteria being exceeded, audit findings indicating systematic problems, or because of client inquiries.

- **Feedback Systems**

The Quality Assurance Officer serves as a focal point for comments concerning problems. By means of accuracy and precision statements and the system report, audits, problems that may have been overlooked by the laboratory supervisors in the course of daily work can be detected and corrected. All client complaints regarding data quality and operational quality (for example turn-around times) are reported to the Laboratory Director and to the Quality Assurance office.

Internal QA Inspection/Corrective Action Procedures - *continued*

- **Customer Services Division**

IAL utilizes a comprehensive and detailed oriented Customer Services Department. The employees working in this department do so very closely with all of IAL's customers. The Customer Services Representatives are available to talk to any of our clients at any time of the day during regular business hours. These Representatives will be the initial stop for client bottle orders, courier service, and fast-track turn around requirements, data concerns and quality issues. All Customer Services Representatives maintain detailed telephone logs to record all activities for a client call. Any client concerns or complaints are taken very seriously at IAL and given top priority in the daily routine. If the Customer Services Representatives cannot resolve the situation to the client's satisfaction, they will consult the Laboratory Director, the QA Officer or the client's Account Manager. Full resolution of the situation will be achieved.

Quality Assurance Reporting

Quality assurance reporting documents the quality control and quality assurance activities in the laboratory and provides a communication and accountability link among analysts, management and clients.

NTEGRATED ANALYTICAL LABORATORIES, LLC
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Sample Preservation, Container, Volume and Holding Time

General Chemistry – Potable and Waste Waters

Parameter	Method	Container	Bottles Sent	Preservation	Holding Time
Acidity	305.1	P,G	250ml P	Cool, 4°C	14 days
Alkalinity	2320B	P,G	500ml P	Cool, 4°C	14 days
Ammonia	350.2+.1	P,G	500ml P aq	H_2SO_4<2, Cool, 4°C	28 days
BOD	405.1	P,G	500ml P	Cool, 4°C	48 hours
Bromide	320.1	P,G	950ml P	None required	28 days
Carbonate	4500CO2 D	P,G	500ml P	Cool, 4°C	14 days
Carbon Dioxide	4500CO2 D	P,G	500ml P	Cool, 4°C	14 days
cBOD	5210B	P,G	500ml P	Cool, 4°C	48 hours
Chloride	4500Cld/ 325.3,.1,.2	P,G	250ml P	None required	28 days
Chlorine Demand	2350B	P,G	4x500ml P	None Required	A.I.
Chlorine Residual	4500Clg	P,G	500ml P	None Required	A.I.
COD	HACH	P,G	250ml P	H_2SO_4<2, Cool, 4°C	28 days
Color	2120B	P,G	250ml P	Cool, 4°C	48 hours
Conductance, Specific	120.1, 2510B	P,G	250ml P	Cool, 4°C	28 days
Corrosivity, Langlier Index	2330B	P,G	950ml P	Cool, 4°C	7 days
Cyanide	335.4/335.3,.2	P, G	500ml P	NaOH>12, Cool, 4°C Ascorbic Acid	14 days, 24hr if sulfide present
Cyanide, Amenable	335.1	P, G	500ml P	NaOH>12, Cool, 4°C Ascorbic Acid	14 days, 24hr if sulfide present
Dissolved Organic Carbon (DOC)	415.1	P,G	250 ml P	H_2SO_4<2, Cool, 4°C	28 days
Flashpoint	1010	P,G	250ml P	None	not specified
Fluoride	4500Fc/ 4500Fbc	P	500ml P	None required	28 days
Hardness	2340B	P,G	250ml P	HNO_3<2(prefer), H_2SO_4<2	6 Months
H_2S	4500-S2-H	P,G	500ml P	Cool, 4°C	Refer to pH, Conductance, TDS.
Iodide	4500-I-B	P,G	250ml P	None required	28 days
Nitrogen, TKN	351.2	P,G	500ml P	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Total	351.1, .2, .3, .4	P,G	950ml P	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Organic	351.1, .2, .3, .4	P,G	950ml P	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Nitrate (NO3)+Nitrite (NO2)	4500NO3F	P,G	250 ml P	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Nitrite (NO2)	4500NO3F/ 4540-085	P,G	250ml P	Cool, 4°C	48 hours
Nitrogen, Nitrate (NO3)	4500NO3F	P,G	250 ml P	Cool, 4°C	48 hours
Odor	2150B	G	950ml P	na	A.I.
Oil & Grease	413.1	G, Teflon	2x950ml Amber	HCl or H2SO4<2, Cool, 4°C	28 days
Oil & Grease	1664A	G, Teflon	2x950ml Amber	HCl<2, Cool, 4°C	28 days
Oxygen, Dissolved	4500Oc, 360.1	G	500ml P	None Required	A.I.
Petroleum Hydrocarbons	418.1	G, Teflon	2x950ml Amber	HCl<2, Cool, 4°C	7 days
pH	150.1,.2	P,G	250ml P	NA	A.I.
Phenols	420.1,.2	G, Teflon	500ml Amber	H_2SO_4<2, Cool, 4°C	28 days
Phosphate, Ortho	365.2	P,G	250ml P	Filter, Cool, 4°C	48 hours
Phosphorus, Total	365.2+.3	P,G	500ml P	H_2SO_4<2, Cool, 4°C	28 days
Solids, Dissolved (TDS) (Residue-Filterable)	2540C	P,G	500ml P	Cool, 4°C	7 days
Solids, Settleable (Residue-Settleable)	2540F	P,G	2x950ml P	Cool, 4°C	48 hours
Solids, Suspended (TSS)(Residue-Nonfilterable)	160.2/2540C	P,G	500ml P	Cool, 4°C	7 days
Solids, Total (Residue-Total)	160.3	P,G	500ml P	Cool, 4°C	7 days
Solids, Volatile	160.4	P,G	500ml P	Cool, 4°C	7 days
Solids, Total, Fixed & Volatile	2540G	P,G	500ml P	Cool, 4°C	7 days
Sulfate	375.2/375.4	P,G	250 ml P	Cool, 4°C	28 days
Sulfide	376.1	P,G	500ml P	NaOH>9 + Zn Acetate, Cool, 4°C	7 days
Sulfite	377.1/4500SO3b	P,G	250 ml P	EDTA fixative	A.I.
Surfactants, MBAS,Foaming Agents	5540C/425.1	P,G	500ml P	Cool, 4°C	48 hours
Total Organic Carbon (TOC)	415.1	P,G	250ml P	H_2SO_4 or HCl<2, Cool, 4°C	28 days
Total Organic Halides (TOX)	9020 B	G, Teflon	250ml Amber	H_2SO_4<2, Cool, 4°C Z.H.S.	28 days
Turbidity	180.1/2130B	P,G	250ml P	Cool, 4°C	48 hours
Petroleum Hydrocarbons	418.1	G, Teflon	2x950ml Amber	H_2SO_4<2, Cool, 4°C	7 days

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Sample Preservation, Container, Volume and Holding Time - *continued*

Metals – Potable and Waste Waters

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Wastewater metals	200.7/200.8	P	250ml P	HNO_3<2	180 days
Potable water metals	200.7/200.8	P	250ml P	HNO_3<2	180 days
Mercury	245.1	P	250ml P	HNO_3<2	28 days
Mercury	245.2	P	250ml P	HNO_3<2	28 days
Hexavalent Chromium	3500CrD	P	500ml P	Cool, 4°C	24 hours

Microbiological – Potable, Waste Waters, and Soils & Wastes

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Total Coliform	9221D	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Coliform	9222B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Coliform	9221B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Coliform	9131	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Coliform	9132	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Coliform + E Coli	9223B +UV	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Coliform	9222B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Coliform	9221B or D	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Coliform	9221E	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Coliform	9222D	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Streptococci, Enterococci	9230B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Streptococci, Enterococci	9230C	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Streptococci	EPA p. 143	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Escherichia Coli	9222B&9221B (3)a(3)+MUG	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Escherichia Coli	9213 D	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Escherichia Coli	1103.1	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Fecal Strep		P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Heterotrophic Bacteria	9215B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Heterotrophic Plate Count	9215 B	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Heterotrophic Plate Count	9215 C	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Heterotrophic Plate Count	9215 D	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Pseudomonas aeruginosa	9213 F	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Pseudomonas aeruginosa	9213 E	P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Total Plate Count		P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours
Other		P,G Sterile	100ml P, Sterile	$Na_2S_2O_3$, Cool, 4°C	6 hours

Organics (GC and GCMS) – Potable and Waste Waters

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Volatiles (Potable)	524.2	G, Teflon, Sep.	2x40ml VO	HCl<2, Cool 4°C	14 days
Volatiles (WasteWater)	624	G, Teflon, Sep.	2x40ml VO	HCl<2, Cool 4°C	14 days
Volatiles, Unpreserved	524.2/624	G, Teflon, Sep.	2x40ml VO	Cool, 4°C	7 days
Trihalomethanes (Potable)	524.2	G, Teflon, Sep.	2x40ml VO	Ascorbic Acid/HCl, Cool 4°C	14 days
Trihalomethanes (WasteWater)	624	G, Teflon, Sep.	2x40ml VO	Ascorbic Acid/HCl, Cool 4°C	14 days
Volatiles: Headspace	3810	G, Teflon, Sep.	2x40ml VO	Cool, 4°C	not specified (14 days)
Volatiles: Non-halogenated, alcohols	8015B	G, Teflon, Sep.	2x40ml VO	Cool, 4°C	7 days
Volatiles: TVH/GRO	624 mod	G, Teflon, Sep.	2x40ml VO	HCl<2, Cool 4°C	14 days
Base Neutrals	625	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
Acid Extractables	625	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
Pesticides/PCB's	608	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
Pesticides	8081A	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
Herbicides	6640B	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
TPH Gasoline Range Organic	8015B	G	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis
TPH Diesel Range Organic	8015B	G, Teflon	2x950ml Amber	Cool, 4°C	7 days extraction, 40 days analysis

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Sample Preservation, Container, Volume and Holding Time - *continued*

General Chemistry – Solids and Hazardous Waste

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Ammonia	350.2+.1	P,G	2oz G	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Nitrate (NO3)+Nitrite (NO2)	4500NO3F	P,G	2oz G	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Nitrite (NO2)	4500NO3F/ 4540-085	P,G	2oz G	Cool, 4°C	48 hours
Nitrogen, Nitrate (NO3)	4500NO3F	P,G	2oz G	Cool, 4°C	48 hours
Nitrogen, TKN	351.2	P,G	2oz G	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Total	351.1, .2, .3, .4	P,G	2oz G	H_2SO_4<2, Cool, 4°C	28 days
Nitrogen, Organic	351.1, .2, .3, .4	P,G	2oz G	H_2SO_4<2, Cool, 4°C	28 days
Cation Exchange Capacity	9081	P,G	2oz G	None required	Not specified
Chloride	9250/9251	P,G	2oz G	None required	Not specified
Cyanide, Total	9014	P,G	2oz G	Cool, 4°C, Ascorbic acid	14 days
Cyanide, Amenable	9012A	P,G	2oz G	Cool, 4°C, Ascorbic acid	14 days
Cyanide, Reactive	7.3.3.2	not specified	2oz G	Cool, 4°C, adjust pH to base upon rec.	14 days
Ignitability	1010/1030	P,G	2oz G	None Required	Not specified
Paint Filter (Free Liquid)	9095	P,G	4oz G	None required	Not specified
PH	9040B/9045C	P,G	2oz G	None required	A.I.
Phenols	9065/9066	G, Teflon	4oz G	H2SO4<2, Cool, 4°C Z.H.S.	28 days
Phosphate, Ortho	365.2	P,G	4oz G	Filter, Cool, 4°C	48 hours
Phosphorus, Total	365.2+.3	P,G	4oz G	H_2SO_4<2, Cool, 4°C	28 days
Oil & Grease-HEM	1664A/9071B	G		Cool, 4°C	Not specified
Solids, Total (Residue-Total)	160.3	P,G	2oz	Cool, 4°C	7 days
Solids, Volatile	160.4	P,G	2oz	Cool, 4°C	7 days
Sulfides	9034	P,G		Cool 4°C, Zinc Acetate	7 days
Sulfate (Turbidimetric-no soils)	9038	P,G	2oz G	Cool, 4°C	Not specified
Specific Conductance	9050A	P,G	2oz G	Cool, 4°C	28 days
Sulfide, Reactive	7.3.4.2	not specified	2oz G	NaOH>12, Cool, 4°C, Zinc Acetate	7 days
Total Organic Carbons	Lloyd Kahn	G, Teflon	2oz Teflon	Cool, 4°C	
Total Organic Halides (TOX)	9020B	G, Teflon	2oz G	H2SO4<2, Cool, 4°C Z.H.S.	7 days
Extractable Organic Halides (EOX)	9023	Amber G, Teflon		Cool, 4°C	28 days
Petroleum Hydrocarbons	418.1m	G, Teflon	2oz G	H_2SO_4<2, Cool, 4°C	7 days

Metals – Solids and Hazardous Waste

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Metals (except mercury)	6020	P, G	2oz G	Cool, 4°C	6 months
Metals (except mercury)	6010B	P, G	2oz G	Cool, 4°C	6 months
Mercury	7470A/7471A	P, G	2oz G	Cool, 4°C	28 days
Hexavalent Chromium	7196A	P, G	2oz G	Cool, 4°C	30 day extraction, 4 days analysis

Organics (GC and GCMS) – Solids and Hazardous Waste

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Volatiles: Methanol preserved soils	5035/8260B	G	2oz Teflon	25ml methanol/surrogate	14 days
Volatiles: Low conc. (PA soils)	5035/8260B	G, Teflon sep.	2oz Teflon	Sodium bisulfate soln	14 days
Volatiles: High conc. (PA soils)	5035/8260B	G, Teflon sep.	2oz Teflon	25ml methanol/surrogate	14 days
Volatiles: EnCore samplers	5035/8260B	Encore	na	repack within 48hr of rcpt @ lab	14 days
Volatiles: Unpreserved soils	8260B	G	2oz Teflon	Cool, 4°C	14 days
Volatiles: Non halogenated;	8015B	G, Teflon	2oz Teflon	Cool, 4°C	Not specified (14 days)
Base Neutrals	8270C	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis
Acid Extractables	8270C	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis
PCB's	8082	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis
Pesticides	8081A	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis
Herbicides	8151A	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis
TPH Gasoline Range Organic	8015B	G	4oz G	Cool, 4°C	14 day extraction, 40 days analysis
TPH Diesel Range Organic	8015B	G, Teflon	8oz G	Cool, 4°C	14 day extraction, 40 days analysis

Sample Preservation, Container, Volume and Holding Time - *continued*

Priority Pollutant Package – Potable and Waste Waters

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
Volatiles	524.2/624	G, Teflon Sep.	2x40ml VO	HCl<2, Cool 4°C	14 days
Acid/Base Neutrals	625	G, Teflon Cap	2x950ml amber	Cool, 4°C	7 days extraction, 40 days analysis
Pesticides/PCB's	608	G, Teflon Cap	2x950ml amber	Cool, 4°C	7 days extraction, 40 days analysis
Metals	200.7/200.8	P	250ml P	HNO_3<2, Cool 4°C	180 days (Hg 28 days)
Cyanide	335.4/335.3,.2	P, G	500ml P	NaOH>12, Cool, 4°C, Ascorbic Acid	14 days, 24hr if sulfide present
Phenols	420.1,.2	G, Teflon	500ml Amber	H_2SO_4<2, Cool, 4°C	28 days

Toxicity Characteristic Leaching Procedure (TCLP) – Waters/Wet Sludge (<50% Solids)

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
TCLP Volatile Organics	1311/624	G, Teflon	2oz Teflon	Cool, 4°C	14 days leach, 14 days analysis
TCLP Acid Extractables/Base Neutrals/Metals	1311/625, 200.7/200.8	G, Teflon	8oz G	Cool, 4°C	BNA: 14 days leach, 7 days extraction, 40 days analysis. Metals (-Hg): 180 days leach, 180 days analysis. Hg: 28 days leach, 28 days analysis.
TCLP Pesticides/Herbicides	1311/8081A, 8151A	G, Teflon	8oz G	Cool, 4°C	14 days leach, 7 days extraction, 40 days analysis.
TCLP Cyanide, Fluoride	1311	G, Teflon	8oz G	Cool, 4°C	14 days leach, 14 days analysis
PCB's (on intact sample)	8082	G, Teflon	8oz G	Cool, 4°C	7 days extraction, 40 days
Ignitability, Sulfide/Cyanide Reactivity		G, Teflon	8oz G	Cool, 4°C	14 days analysis

Toxicity Characteristic Leaching Procedure (TCLP) – Waters/Wet Sludge (>50% Solids)

Parameter	Method	Container	Bottles sent	Preservation	Holding Time
TCLP Volatile Organics	1311/624	G, Teflon	3X40ml VO	HCl<2, Cool 4°C	14 days leach/14 days analysis.
TCLP Acid Extractables	1311/625	G, Teflon	2x950ml amber	Cool, 4°C	7 days leach/7 days extract/40 days analysis
TCLP Base Neutral Extractables	1311/625	G, Teflon	2x950ml amber	Cool, 4°C	7 days leach/7 days extract/40 days analysis
TCLP Metals	1311/200.7, 200.8	G, Teflon	950 ml P	Cool, 4°C	Metals (-Hg:) 180 days leach, 180 days analysis. Hg: 28 days leach, 28 days analysis.
TCLP Pesticides/Herbicides	1311/8081A, 8151A	G, Teflon	2x950ml amber	Cool, 4°C	7 days leach/7 days extract/40 days analysis
TCLP Cyanide		G, Teflon	500ml P	Cool, 4°C	14 days leach/14 days analysis
PCB's	8082	G, Teflon	2x950ml amber	Cool, 4°C	7 days extraction/40 days analysis
Ignitability, Sulfide/Cyanide Reactivity		G, Teflon	500ml P	Cool, 4°C	14 days analysis.

TABLE KEY:			
P	Plastic	Z.H.S.	Zero Head Space
G	Glass	A.I.	Analyze Immediately
Amber	Amber Glass Jar	na	not applicable

IAL Preservative Guide

IDENTIFICATION:

• RED	Nitric Acid (HNO3)	1 to 1 Concentration
YELLOW	Sulfuric Acid (H2SO4)	1 to 1 Concentration
• BLUE	Ascorbic Acid (NaOH)	10 N Concentration
• GREEN	Hydrochloric Acid (HCl)	1 to 1 Concentration

304713

Appendix A: Forms

1) Chain of Custody

2) Glassware Order Form

3) Request for Expedited Turnaround Times

4) Sample Receipt Verification

Phone # (973) 36[redacted]
Fax # (973) 989-5[redacted]

INTEGRATED ANALYTI[redacted]L LABORATORIES
CHAIN OF [redacted]STODY

2[redacted]anklin Rd
R[redacted], NJ 07869

CLIENT & PROJECT

Name:	
Address:	
Telephone #:	
Fax #:	
Project Name:	
Project Manager:	
Reference ID#: PO#:	

REPORTING

Fax to:	
Fax #:	
Report to:	
Address:	
Invoice to:	
Address:	

Turnaround Time

Conditional / TPHC
24 hr* 48 hr 72 hr 1 wk NA Other:

Verbal/Fax
24 hr* 48 hr* 72 hr* 1 wk* 2 wk Other:

Hard Copy
72 hr* 1 wk* 2 wk* 3 wk Other:

***Prior to sample arrival, Lab notification is required.**

Report Format

Results Only
Reduced
Regulatory
SRP Disk**: dbf or wk1
Other:

ANALYTICAL PARAMETERS / PRESERVATIVES

** Circle format required

1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	Preservatives
										1. HCL 3. HNO_3
										2. NaOH 4. H_2SO_4
										5. MeOH 6. Other
										COOLER TEMP. °C

SAMPLE INFORMATION

SAMPLE MATRIX
W - Waste SL - Sludge A - Aqueous
O - Oil X - Other S - Soil
GW - Groundwater SOL - Solid

Sample ID	Sample Description	Sampling Date	Sampling Time	am	pm	Matrix	# of Containers	Lab ID	Comments

rint legibly and fill out completely. Samples cannot be processed and the turnaround time will not start until any ambiguities have been r

Concentrations Expected
LOW MED HIGH

Known Hazard: yes no
Describe:

CUSTODY LOG

Signature	Date	Time	Signature
Relinquished by:			Received by:
Relinquished by:			Received by:
Relinquished by:			Received by:
Relinquished by:			Received by:
Relinquished by:			Received by:

Comments:

Lab Case #

PAGE: OF

LAB COPIES - WHITE & YELLOW; CLIENT COPY - PINK

304715

INTEGRATED ANALYTICAL LABS
GLASSWARE ORDER

Fax to: IAL (973) 989-5288

Questions ?: Call (973) 361-4252

CLIENT/CO. NAME: SHIP TO:

PROJECT #/NAME:

PROJECT MANAGER: REQUESTED BY:

EXPECTED SAMPLING DATE: Turn Around Time Needed:

SAMPLE ARRIVAL (Please confirm pick up with laboratory):

Mon. Tues. Wed. Thurs. Fri.* Other

NO. OF SAMPLES/MATRIX (A= Aqueous) (S= Soil) (O=Other: Describe)	PARAMETER TO BE ANALYZED	(CHECK IF NEEDED) FIELD BLANKS (FB)	TRIP BLANKS (TB)	TO BE COMPLETED BY LAB # OF CONTAINERS, SIZE AND TYPE REQUIRED FOR EACH SAMPLE	PRESERVATIVE (IF ANY)

Comments:

FOR LAB USE ONLY:

Received by: Date Prepared:

Date/Time: Order Prepared by:

Date Shipped/Delivered: UPS #(If any):

ITEMS INCLUDED:

[ ] Chain of Custody
[ ] Labels for Bottles
[ ] Cooler w/Ice Pack
[ ] Zip Lock Bag
[ ] Custody Seals
[ ] DI Water for Blanks
[ ] SCALE
[ ] Other: _____
[ ] Separate Preservatives (If required)

*** NOTE:** *** NOTE: Some tests have short holding times.**
Please check with the lab prior to arrival so holding times DO NOT expire.

304716

RUSH

RUSH #
R00001

IAL EXPEDITED TURNAROUND FORM

CASE #

☐ New Job
☐ Job Revised
☐ Job Delayed
☐ Job Cancelled

Client/Project: _____
Client Contact: _____
Sample Arrival Via: _____
PM/Notified By: _____

Report Type
○ Standard
◉ Reduced
○ Regulatory

Expected Sample Arrival (Day/Date/Time):	Results Due (Day/Date/Time):
Delayed Arrival:	Delayed Results Due:

Extraction Due: GC _____ TCLP _____ GC/MS _____

# of Samples S	A	X	Analysis Required	If VO Analysis: MeOH?	624/8260?	Approved By	Alternate Date and Approval

Special Notes (Including Limit Information):

_____
_____
_____
_____

Sampling Event/Project Complete Incomplete

304717

INTEGRATED ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIPT VERIFICATION

CASE NO: 0001 CLIENT:

COOLER TEMPERATURE: 2° - 6°C: _____ (See Chain of Custody)

CHAIN OF CUSTODY: COMPLETE / INCOMPLETE Comments: _____

Sample Bottles Intact: _____ Comments: _____
Sample Labels Intact/ Correct: _____
Sufficient Sample Volume: _____
Correct bottles/ preservative: _____
Samples received in holding time/ prep time: _____
Headspace/ bubbles in voa samples: _____
Samples to be subcontracted: _____

Preserved Sample pH checked: _____
(Excluding voa samples)

KEY
✓ = YES
✗ = NO
(✓) = N/A

ADDITIONAL COMMENTS: _____

SAMPLE(S) VERIFIED BY: INITIAL _____ DATE _____

CORRECTIVE ACTION REQUIRED: **YES** _____ **NO** _____

CLIENT NOTIFIED: YES _____ Date/ Time: _____ NO _____

PROJECT CONTACT: _____

SUBCONTRACTED LAB: _____
DATE SHIPPED: _____

CORRECTIVE ACTION BY CLIENT: _____

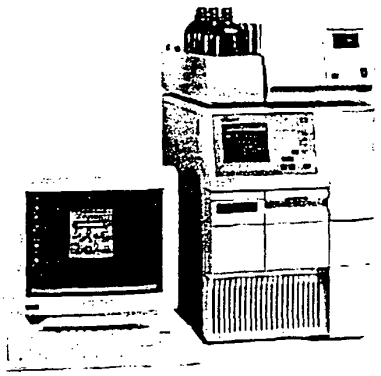
CORRECTIVE ACTION TAKEN: _____

CONCLUSION: _____

Corrective Action taken by: INITIAL ____ DATE ____

304718

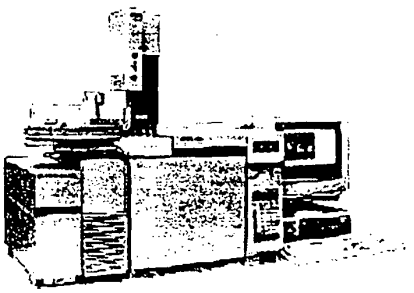
Appendix B: Instrumentation



High Performance Liquid Chromatography (HPLC)

- Two (2) Waters HPLC with PDA, EC and UV Detectors with Millennium 32 Software

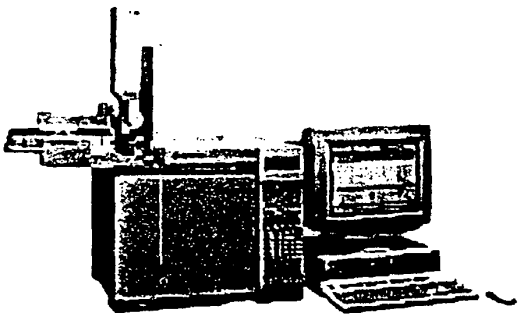
Gas Chromatography / Mass Spectrometry (GC/MS)



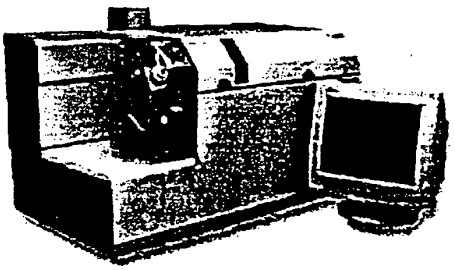
- One (1) Agilent Technologies / HP 6890 Gas Chromatograph / 5973 Mass Spectrophotometer with O.I. 4560 / 4552 Auto Sampler
- One (1) HP 6890 Gas Chromatograph / 5973 Mass Spectrophotometer with HP 6890 Auto Sampler
- One (1) HP 6890 Gas Chromatograph / 5973 Mass Spectrophotometer with O.I. 4560 / 4551 Auto Sampler
- One (1) HP 6890 Gas Chromatograph / 5973 Mass Spectrophotometer with O.I. 4560 / 4552 Auto Sampler
- One (1) HP 5890 II Gas Chromatograph / 5971 Mass Spectrophotometer with HP 7673A Auto Sampler
- One (1) HP 5890 Gas Chromatograph / 5970B Mass Spectrophotometers with O.I. 4560 / 4551 Auto Samplers
- One (1) HP 5890 Gas Chromatograph / 5970B Mass Spectrophotometers with O.I. 4560 / 4552 Auto Samplers
- One (1) HP 5890 Gas Chromatograph / 5970B Mass Spectrophotometer with Tekmar LSC 2000 / O.I. 4552 Auto Sampler

Appendix B: Instrumentation - *continued*

Gas Chromatography



- One (1) Agilent Technologies / HP 6890 Gas Chromatograph with FID Detectors and 7683 Auto Sampler
- One (1) HP 6890 Gas Chromatograph with Dual Micro-ECD Detectors and 7683 Auto Sampler
- One (1) Varian 3400 Gas Chromatograph with Dual ECD Detectors and CTC A200S Auto Sampler
- One (1) HP 5890 Gas Chromatograph with Dual ECD Detectors and 7673 Auto Sampler
- Two (2) HP 5890 Gas Chromatograph with FID Detectors and 7673 Auto Sampler
- One (1) Varian 3400 Gas Chromatograph with TCD / FID Detectors



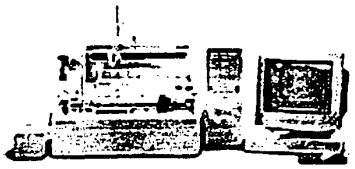
Metals

- Two (2) Hewlett Packard 4500 ICP Mass Spectrometer
- One (1) Spectro ICP Spectrophotometer
- One (1) Perkin Elmer 3100 Flame Atomic Absorption Spectrophotometer
- One (1) Varian Spectra 400 Zeeman Graphite Furnace Atomic Absorption Spectrophotometer
- One (1) Perkin Elmer AAnalyst 100 Atomic Absorption Spectrophotometer

Extraction / Preparation

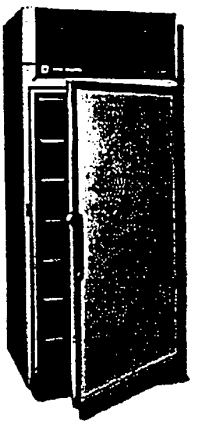
- One (1) Dionex Pressure Fluid Extractor
- Three (3) Zymark Turbo Vap Concentrators
- Six (6) Position Lab-Line Multi-Unit Extraction Heater
- Twelve (12) Millipore Zero Headspace Extraction Vessels
- Two (2) Four Position Millipore Rotary Agitators
- Two (2) Millipore Positive Pressure Filtration Unit
- Ten (10) Position TCLP Extraction Rotary Agitators
- Four (4) Tekmar Sonic Disruptor

Appendix B: Instrumentation - *continued*



General Chemistry

- One (1) LACHAT QuikChem Autoanalyzer
- One (1) Denver Instruments pH Meter
- One (1) Labconco Micro Digestor
- Two (2) Ohaus E400 Balance
- One (1) Mettler PB 302 Balance
- One (1) HACH One pH Meter
- One (1) Blue-M Stabil-Therm Gravity Oven
- One (1) NEY 2-525 Series II Muffle Furnace (TVS, % Ash)
- One (1) VWR 1300 U Oven
- One (1) Fisher Isotemp Oven 200 Series 2300
- Ten (10) Dessicators
- One (1) Boekel Flash Point Tester 152800
- Ten (10) Position Midi-Cyanide Distillation Apparatus
- One (1) Orion Dissolved Oxygen Meter 820
- One (1) Perkin Elmer Fourier Transform Infra Red Spectrophotometer
- One (1) HACH UV Spectrophotometer DR/3000
- One (1) Beckman ISE Meter
- One (1) O.I. TOC Analyzer 700
- One (1) Hanna Instrument Conductivity Meter
- One (1) Sartorius Analytical Balance
- One (1) Turbidity Meter
- One (1) Perkin Elmer Lambda 20 UV/VIS Spectrophotometer
- One (1) Accumet 150 Coulometric KF Titrator
- One (1) VWR Water Bath 1203
- One (1) Ohaus GA110 Analytical Balance
- One (1) VWR 550 T Aquasonic Sonicator
- One (1) Mettler AG204 Analytical Balance
- One (1) Melting Point Apparatus
- One (1) Distek 2100B Dissolution System
- Three (3) Forma Scientific 390 Environmental Chambers
- One (1) International Equipment Model HN Centrifuge
- One (1) Corning Model 350 pH / Ion Analyzer
- One (1) VWR Model V Centrifuge



Microbiology

- One (1) Autoclave – Getinge Novus I
- Three (3) Incubators – Bellco Model BRPO 821, VWR Incubator, Prospore Model 120
- One (1) Binocular (dissection) microscope – Southern Precision Instruments Model 1891
- One (1) All American Pressure Cooker Model 25X-1
- One (1) Sartorius Balance Model CP153
- One (1) Entech Ultraviolet Light (Longwave-Black light) UVL28
- One (1) Quebec type colony counter - Model 3325
- One (1) Ultraviolet Sterilizer – Millipore XX6370000
- One (1) Beckman pH Meter Model 340
- One (1) Autoclave NAPCO E Series Model 9000D
- One (1) Microscope Olympus BH
- One (1) Refrigerator United USF

304721

Laboratory Information Management System (LIMS)

HARDWARE

Network Server
- One (1) SQL Servers
- One (1) Internet Information Server
- Four (4) NT Servers

Workstation
- Over fifty (50) PCs with Pentium II Processors

Printer
- One (1) HP Professional Series Color Printer 2500C+
- One (1) HP Laser Color Printer
- Eight (8) HP Laser Printers
- Two (2) Color DeskJet Printers
- Three (3) Dot Matrices Printers
- One (1) Label Printer

Scanner
- One (1) Color Flatbed Scanner
- Two (2) B&W Sheetfed Scanner
- Two (2) Barcode Scanners

Storage Devices
- Two (2) CD Recordable Drives
- One (1) CD Rewritable Drive
- One (1) CD Tower
- Two (2) Backup Tape Drives

SOFTWARE

Operating System
- Windows 98
- Windows 95
- Windows NT

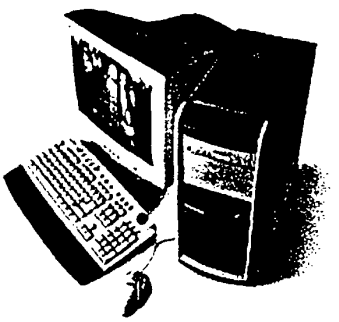
Programming Software
- FoxPro
- Visual Basic
- DHTML
- Active Server Page
- HP Chemstation Macro Language
- VBA

Commercial Software
- Microsoft Office
- HP Chemstation
- Spectrum for Windows

Networking
- MS-Windows LAN
- TCP/IP
- NetBEUI
- Windows NT LAN

Database
- SQL Server
- Microsoft Access
- FoxPro
- Oracle

COMMERCIAL SOFTWARE
- Microsoft Office
- HP Chemstation
- Spectrum for Windows
- ChemSW Control Chart
- ACT! 4.0
- Lab Systems Nautilus LIMS



304722

State of New Jersey
Department of Environmental Protection
Certifies That

INTERGRATED ANALYTICAL LABORATORIES, LLC

LABORATORY CERTIFICATION ID # 14751

having duly met the requirements of the
Regulations Governing The Certification Of
Laboratories And Environmental Measurements N.J.A.C. 7:18 et. seq.
and
having been found compliant with the standards approved by the
National Environmental Laboratory Accreditation Conference
is hereby approved as a
State Certified Environmental Laboratory
to perform the analyses as indicated on the Annual Certified Parameter List
which must accompany this certificate to be valid

Expiration Date June 30, 2003

Joseph F. Aiello, Chief
Office of Quality Assurance

NJDEP is a NELAP Recognized Accrediting Authority

THIS CERTIFICATE IS TO BE CONSPICUOUSLY DISPLAYED AT THE LABORATORY WITH THE ANNUAL CERTIFIED PARAMETER LIST IN A LOCATION ON THE PREMISES VISIBLE TO THE PUBLIC

304723

Annual Certified Parameter List and Current Status

INTEGRATED ANALYTICAL LABS
273 FRANKLIN ROAD
RANDOLPH, NJ 07869
Lab ID 14751

Effective Date: 07/01/2002 Expiration Date: 06/30/2003

Status	Code	Parameter	EPA	ASTM	SM18	USGS	SW846	Other	Primary Accrediting Authority
A	SDW01.01000	TOTAL COLIFORM			9221 D				NJ
A	SDW01.02000	TOTAL COLIFORM			9222 B				NJ
A	SDW01.03000	TOTAL COLIFORM			9221 B				NJ
D	SDW01.05000	TOTAL COLIFORM/ E. COLI			9223 B + UV				
C	SDW01.06000	TOTAL COLIFORM / E. COLI			9223 B + UV				NJ
D	SDW01.06010	TOTAL COLIFORM / E. COLI						Charm Science, Inc.	
D	SDW01.06020	TOTAL COLIFORM / E. COLI						HACH Company	
A	SDW01.07000	FECAL COLIFORM			9222B OR 9221B OR D & 9221 E				NJ
A	SDW01.10000	ESCHERICHIA COLI			9222 B OR 9221 B & 9221 E + MUG				NJ
D	SDW01.11000	ESCHERICHIA COLI			9222 B & 9221 B(3)a(3) + MUG				
A	SDW01.14000	HETEROTROPHIC BACTERIA			9215 B				NJ
C	SDW02.01000	TURBIDITY	180.1						NJ
C	SDW02.02000	NITRATE			4500-NO3- F				NJ
C	SDW02.06000	NITRITE			4500-NO3-F				NJ
C	SDW02.13000	FLUORIDE			4500 F-C				NJ
C	SDW02.15200	CYANIDE	335.4						NJ
C	SDW02.17000	SULFATE	375.2						NJ
C	SDW02.20000	SODIUM	200.7						NJ
C	SDW02.24000	TOT DISSOLVED SOLIDS			2540C				NJ
C	SDW02.27000	CALCIUM	200.7						NJ

Joseph F. Aiello, Chief

304724

Annual Certified Parameter List and Current Status

INTEGRATED ANALYTICAL LABS
273 FRANKLIN ROAD
RANDOLPH, NJ 07869
Lab ID 14751

Effective Date: 07/01/2002 Expiration Date: 06/30/2003

Status	Code	Parameter	EPA	ASTM	SM18	USGS	SW846	Other	Primary Accrediting Authority
C	SDW02.27300	TOTAL HARDNESS			3120B/3111B OR 2340 B				NJ
C	SDW02.28000	ALKALINITY			2320 B				NJ
A	SDW02.30000	CHLORIDE			4500 Cl-D				NJ
C	SDW02.32000	COLOR			2120 B				NJ
C	SDW02.33000	FOAMING AGENTS			5540 C				NJ
C	SDW02.34000	ODOR			2150 B				NJ
C	SDW02.35000	CONDUCTIVITY			2510 B				NJ
C	SDW03.03000	CHLORINE,RESIDUAL DISINFECTANT			4500-Cl G				NJ
C	SDW03.08000	pH, HYDROGEN ION	150.1						NJ
C	SDW03.09000	TEMPERATURE			2550 B				NJ
C	SDW04.03100	ALUMINUM	200.8						NJ
C	SDW04.07000	ANTIMONY	200.8						NJ
C	SDW04.12000	ARSENIC	200.8						NJ
C	SDW04.17000	BARIUM	200.8						NJ
C	SDW04.21000	BERYLLIUM	200.8						NJ
C	SDW04.25000	CADMIUM	200.8						NJ
C	SDW04.29000	CHROMIUM	200.8						NJ
D	SDW04.30000	COPPER							NJ
D	SDW04.33000	COPPER							NJ
C	SDW04.34000	COPPER	200.8						NJ
C	SDW04.37000	IRON	200.7						NJ
D	SDW04.39000	LEAD							NJ
C	SDW04.40000	LEAD	200.8						NJ

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C	SDW04.41100	MAGNESIUM	200.7						NJ
C	SDW04.44000	MANGANESE	200.7						NJ
C	SDW04.45000	MANGANESE	200.8						NJ
C	SDW04.46000	MERCURY	245.1						NJ
D	SDW04.47000	MERCURY							NJ
A	SDW04.48000	MERCURY	200.8						NJ
C	SDW04.52000	NICKEL	200.7						NJ
C	SDW04.53000	NICKEL	200.8						NJ
C	SDW04.57000	SELENIUM	200.8						NJ
C	SDW04.62000	SILVER	200.7						NJ
C	SDW04.63000	SILVER	200.8						NJ
C	SDW04.65000	THALLIUM	200.8						NJ
C	SDW04.67000	ZINC	200.7						NJ
C	SDW04.68000	ZINC	200.8						NJ
C	SDW06.01010	BROMOFORM	524.2						NJ
C	SDW06.01020	CHLOROFORM	524.2						NJ
C	SDW06.01030	DIBROMOCHLOROMETHANE	524.2						NJ
C	SDW06.01040	DICHLOROBROMOMETHANE	524.2						NJ
C	SDW06.02010	BENZENE	524.2						NJ
C	SDW06.02020	CARBON TETRACHLORIDE	524.2						NJ
C	SDW06.02030	CHLOROBENZENE	524.2						NJ
C	SDW06.02040	1,2-DICHLOROBENZENE	524.2						NJ
C	SDW06.02050	1,3-DICHLOROBENZENE	524.2						NJ
C	SDW06.02060	1,4-DICHLOROBENZENE	524.2						NJ

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C	SDW06.02070	1,1-DICHLOROETHANE	524.2						NJ
C	SDW06.02080	1,2-DICHLOROETHANE	524.2						NJ
C	SDW06.02090	cis-1,2-DICHLOROETHENE	524.2						NJ
C	SDW06.02100	trans-1,2-DICHLOROETHENE	524.2						NJ
C	SDW06.02110	DICHLOROMETHANE (methylene chloride)	524.2						NJ
C	SDW06.02120	1,2-DICHLOROPROPANE	524.2						NJ
C	SDW06.02130	ETHYLBENZENE	524.2						NJ
C	SDW06.02140	METHYL-TERT-BUTYL-ETHER	524.2						NJ
C	SDW06.02150	NAPHTHALENE	524.2						NJ
C	SDW06.02160	STYRENE	524.2						NJ
C	SDW06.02170	1,1,2,2-TETRACHLOROETHANE	524.2						NJ
C	SDW06.02180	TETRACHLOROETHENE	524.2						NJ
C	SDW06.02190	1,1,1-TRICHLOROETHANE	524.2						NJ
C	SDW06.02200	TRICHLOROETHENE	524.2						NJ
C	SDW06.02210	TOLUENE	524.2						NJ
C	SDW06.02220	1,2,4-TRICHLOROBENZENE	524.2						NJ
C	SDW06.02230	1,1-DICHLOROETHENE	524.2						NJ
C	SDW06.02240	1,1,2-TRICHLOROETHANE	524.2						NJ
C	SDW06.02250	VINYL CHLORIDE	524.2						NJ
C	SDW06.02260	XYLENES (TOTAL)	524.2						NJ
C	SDW06.03010	BROMOBENZENE	524.2						NJ
C	SDW06.03020	BROMOCHLOROMETHANE	524.2						NJ
C	SDW06.03030	BROMOMETHANE	524.2						NJ

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C	SDW06.03040	n-BUTYLBENZENE	524.2						NJ
C	SDW06.03050	sec-BUTYLBENZENE	524.2						NJ
C	SDW06.03060	tert-BUTYLBENZENE	524.2						NJ
C	SDW06.03070	CHLOROETHANE	524.2						NJ
C	SDW06.03080	CHLOROMETHANE	524.2						NJ
C	SDW06.03090	o-CHLOROTOLUENE	524.2						NJ
C	SDW06.03100	p-CHLOROTOLUENE	524.2						NJ
C	SDW06.03110	1,2-DIBROMO-3-CHLOROPROPANE	524.2						NJ
C	SDW06.03120	1,2-DIBROMOETHANE	524.2						NJ
C	SDW06.03130	DIBROMOMETHANE	524.2						NJ
C	SDW06.03140	DICHLORODIFLUOROMETHANE	524.2						NJ
C	SDW06.03150	1,3-DICHLOROPROPANE	524.2						NJ
C	SDW06.03160	2,2-DICHLOROPROPANE	524.2						NJ
C	SDW06.03170	1,1-DICHLOROPROPENE	524.2						NJ
C	SDW06.03180	cis-1,3-DICHLOROPROPENE	524.2						NJ
C	SDW06.03190	trans-1,3-DICHLOROPROPENE	524.2						NJ
C	SDW06.03200	HEXACHLOROBUTADIENE	524.2						NJ
C	SDW06.03210	ISOPROPYLBENZENE	524.2						NJ
C	SDW06.03220	p-ISOPROPYLTOLUENE	524.2						NJ
C	SDW06.03230	n-PROPYLBENZENE	524.2						NJ
C	SDW06.03240	1,1,1,2-TETRACHLOROETHANE	524.2						NJ
C	SDW06.03250	1,2,3-TRICHLOROBENZENE	524.2						NJ
C	SDW06.03251	1,3,5-TRICHLOROBENZENE	524.2						NJ
C	SDW06.03260	TRICHLOROFLUOROMETHANE	524.2						NJ

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C	SDW06.03270	1,2,3-TRICHLOROPROPANE	524.2						NJ
C	SDW06.03280	1,2,4-TRIMETHYLBENZENE	524.2						NJ
C	SDW06.03300	1,3,5-TRIMETHYLBENZENE	524.2						NJ
A	SDW06.03310	NITROBENZENE	524.2						NJ
C	SDW06.03410	ACETONE	524.2						NJ
C	SDW06.03420	ACRYLONITRILE	524.2						NJ
C	SDW06.03430	ALLYL CHLORIDE	524.2						NJ
C	SDW06.03440	2-BUTANONE	524.2						NJ
C	SDW06.03450	CARBON DISULFIDE	524.2						NJ
C	SDW06.03460	CHLOROACETONITRILE	524.2						NJ
C	SDW06.03470	1-CHLOROBUTANE	524.2						NJ
C	SDW06.03480	trans-1,4-DICHLORO-2-BUTENE	524.2						NJ
C	SDW06.03490	1,1-DICHLOROPROPANONE	524.2						NJ
C	SDW06.03500	DIETHYL ETHER	524.2						NJ
C	SDW06.03510	ETHYL METHACRYLATE	524.2						NJ
C	SDW06.03520	HEXACHLOROETHANE	524.2						NJ
C	SDW06.03530	2-HEXANONE	524.2						NJ
C	SDW06.03540	METHACRYLONITRILE	524.2						NJ
C	SDW06.03550	METHYLACRYLATE	524.2						NJ
C	SDW06.03560	METHYL IODIDE	524.2						NJ
C	SDW06.03570	METHYLMETHACRYLATE	524.2						NJ
C	SDW06.03580	4-METHYL-2-PENTANONE	524.2						NJ
C	SDW06.03590	2-NITROPROPANE	524.2						NJ
C	SDW06.03600	PENTACHLOROETHANE	524.2						NJ

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C	SDW06.03610	PROPIONITRILE	524.2						NJ
C	SDW06.03615	TERTBUTYL ALCOHOL	524.2						NJ
C	SDW06.03620	TETRAHYDROFURAN	524.2						NJ
A	SHW01.01000	TOTAL COLIFORM					9131, REV 0, 9/86		NJ
A	SHW01.02000	TOTAL COLIFORM					9132, REV 0, 9/86		NJ
C	SHW02.01000	IGNITABILITY					1010 REV 0, 9/86		NJ
C	SHW02.02100	IGNITABILITY OF SOLIDS					1030, REV0, 12/96		NJ
C	SHW02.03000	CORROSIVITY, pH WASTE, >20% WATER					9040B, REV 2, 1/95		NJ
C	SHW02.05000	REACTIVITY					7.3.3.2, REV 3, 12/96		NJ
C	SHW02.06000	REACTIVITY					7.3.4.2, REV 3, 12/96		NJ
C	SHW02.06900	VOLATILE ORGANICS					1311, REV 0, 7/92		NJ
C	SHW02.07000	METALS/SEMI VOLATILE ORGANICS					1311, REV 0, 7/92		NJ
C	SHW02.07100	METALS/ORGANICS					1310A, REV 1, 7/92		NJ
C	SHW02.08000	METALS/ORGANICS					1312, REV 0, 9/94		NJ
C	SHW03.01000	pH, HYDROGEN ION					9040B, REV 2, 1/95		NJ
C	SHW03.02000	TEMPERATURE					2550-B, SM18		NJ
C	SHW04.01000	METALS, TOTAL REC. + DISSOLVED					3005A, REV 1, 7/92		NJ
C	SHW04.01500	METALS, TOTAL					3010A, REV 1, 7/92		NJ
C	SHW04.02000	METALS					3020A, REV 1, 7/92		NJ
C	SHW04.03000	METALS					3050B, REV 2, 12/96		NJ
C	SHW04.03700	METALS					3060A, REV 1, 12/96		NJ
A	SHW04.05000	ALUMINUM					6010B REV 2, 12/96		NJ
C	SHW04.05500	ALUMINUM					6020, REV 0, 9/94		NJ

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A	SHW04.06500	ANTIMONY					6010B, REV 2, 12/96		NJ
C	SHW04.07000	ANTIMONY					6020, REV 0, 9/94		NJ
A	SHW04.09000	ARSENIC					6010B, REV 2, 12/96		NJ
C	SHW04.09500	ARSENIC					6020, REV 0, 9/94		NJ
A	SHW04.11500	BARIUM					6010B, REV 2, 12/96		NJ
C	SHW04.12000	BARIUM					6020, REV 0, 9/94		NJ
A	SHW04.13500	BERYLLIUM					6010B, REV 2, 12/96		NJ
C	SHW04.14000	BERYLLIUM					6020, REV 0, 9/94		NJ
A	SHW04.15100	BORON					6010B, REV 2, 12/96		NJ
A	SHW04.15500	CADMIUM					6010B, REV 2, 12/96		NJ
C	SHW04.16000	CADMIUM					6020, REV 0, 9/94		NJ
C	SHW04.17500	CALCIUM					6010B, REV 2, 12/96		NJ
A	SHW04.18500	CHROMIUM					6010B, REV 2, 12/96		NJ
C	SHW04.19000	CHROMIUM					6020, REV 0, 9/94		NJ
C	SHW04.21000	CHROMIUM (VI)					7196A, REV 1, 7/92		NJ
A	SHW04.22500	COBALT					6010B, REV 2, 12/96		NJ
C	SHW04.23000	COBALT					6020, REV 0, 9/94		NJ
A	SHW04.24500	COPPER					6010B, REV 2, 12/96		NJ
C	SHW04.25000	COPPER					6020, REV 0, 9/94		NJ
C	SHW04.26000	IRON					6010B, REV 2, 12/96		NJ
A	SHW04.27500	LEAD					6010B, REV 2, 12/96		NJ
C	SHW04.28000	LEAD					6020, REV 0, 9/94		NJ
C	SHW04.30500	MAGNESIUM					6010B, REV 2, 12/96		NJ
A	SHW04.31500	MANGANESE					6010B, REV 2, 12/96		NJ

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C	SHW04.31600	MANGANESE					6020, REV 0, 9/94		NJ
A	SHW04.33000	MERCURY, LIQUID WASTE					7470A, REV 1, 9/94		NJ
C	SHW04.33500	MERCURY, SOLID WASTE					7471A, REV 1, 9/94		NJ
C	SHW04.34000	MOLYBDENUM					6010B, REV 2, 12/96		NJ
A	SHW04.35500	NICKEL					6010B, REV 2, 12/96		NJ
C	SHW04.36000	NICKEL					6020, REV 0, 7/92		NJ
C	SHW04.38000	POTASSIUM					6010B, REV 2, 12/96		NJ
A	SHW04.39000	SELENIUM					6010B, REV 2, 12/96		NJ
C	SHW04.40600	SELENIUM					6020, REV 0, 9/94	6020, REV 0, 9/94	NJ
A	SHW04.41000	SILVER					6010B, REV 2, 12/96		NJ
C	SHW04.41500	SILVER					6020, REV 0, 9/94		NJ
D	SHW04.42000	SILVER							NJ
D	SHW04.42500	SILVER							NJ
C	SHW04.43000	SODIUM					6010B, REV 2, 12/96		NJ
C	SHW04.45500	THALLIUM					6020, REV 0, 9/94		NJ
C	SHW04.47100	TIN					6010B REV 2 12/96		NJ
C	SHW04.47500	VANADIUM					6010B, REV 2, 12/96		NJ
A	SHW04.49000	ZINC					6010B, REV 2, 12/96		NJ
C	SHW04.49500	ZINC					6020, REV 0, 9/94		NJ
A	SHW05.00000	ORGANIC EXTRACTION					3500B, REV 2, 12/96		NJ
C	SHW05.01000	SEMIVOLATILE ORGANICS					3510C, REV 3, 12/96		NJ
C	SHW05.02000	SEMIVOLATILE ORGANICS					3520C, REV 3, 12/96		NJ
A	SHW05.02100	SEMIVOLATILE ORGANICS					3535, REV 0, 12/96		NJ
C	SHW05.03000	SEMIVOLATILE ORGANICS					3540C, REV 3, 12/96		NJ

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A	SHW05.04000	SEMIVOLATILE ORGANICS					3541, REV 0, 9/94		NJ
C	SHW05.04200	SEMIVOLATILE ORGANICS					3545, REV 0, 12/96		NJ
C	SHW05.05000	SEMIVOLATILE ORGANICS					3550B, REV 2, 12/96		NJ
A	SHW05.05100	SEMIVOLATILE ORGANICS					3560, REV 0, 12/96		NJ
A	SHW05.05200	SEMIVOLATILE ORGANICS					3561, REV 0, 12/96		NJ
C	SHW05.06000	ORGANICS					3580A, REV 1, 7/92		NJ
A	SHW05.06100	ORGANICS					3585, REV 0, 12/96		NJ
A	SHW05.06200	VOLATILE ORGANICS					5021, REV 0, 12/96		NJ
C	SHW05.07000	VOLATILE ORGANICS					5030B, REV 2, 12/96		NJ
C	SHW05.07300	VOLATILE ORGANICS LOW CONC.					5035, REV 0, 12/96		NJ
C	SHW05.07310	VOLATILE ORGANICS HIGH CONC.					5035, REV0 12/96		NJ
C	SHW05.10000	SEMIVOLATILE ORGANICS					3610B, REV 3, 12/96		NJ
C	SHW05.11000	SEMIVOLATILE ORGANICS					3611B, REV 2, 12/96		NJ
C	SHW05.12000	SEMIVOLATILE ORGANICS					3620B, REV 2, 12/96		NJ
A	SHW05.13000	SEMIVOLATILE ORGANICS					3630C, REV 3, 12/96		NJ
C	SHW05.14000	SEMIVOLATILE ORGANICS					3640A, REV 1, 9/94		NJ
C	SHW05.15000	SEMIVOLATILE ORGANICS					3650B, REV 2, 12/96		NJ
C	SHW05.16000	SEMIVOLATILE ORGANICS					3660, REV 2, 12/96		NJ
C	SHW05.17000	SEMIVOLATILE ORGANICS					3665A, REV 1, 12/96		NJ
A	SHW05.18000	VOLATILE ORGANICS					3810, REV 0, 9/86		NJ
A	SHW06.02010	1,2-DIBROMOETHANE					8011, REV 0, 7/92		NJ
A	SHW06.02020	1,2-DIBROMO-3-CHLOROPROPANE					8011, REV 0, 7/92		NJ
C	SHW06.03000	VOLATILE ORGANICS, NON HALOGEN					8015B, REV 2, 12/96		NJ
C	SHW06.03090	ISOBUTYL ALCOHOL					8015B, REV 2, 12/96		NJ

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A	SHW06.03170	ETHYLENE GLYCOL					8015B, REV 2, 12/96		NJ
A	SHW06.03180	METHANOL					8015B, REV 2, 12/96		NJ
C	SHW06.04010	GASOLINE RANGE ORGANIC					8015B REV2 12/96		NJ
C	SHW06.04500	DIESEL RANGE ORGANIC					8015B REV2 12/96		NJ
C	SHW06.12010	ALDRIN					8081A, REV 1, 12/96		NJ
C	SHW06.12020	ALPHA-BHC					8081A, REV 1, 12/96		NJ
C	SHW06.12030	BETA-BHC					8081A, REV 1, 12/96		NJ
C	SHW06.12040	DELTA-BHC					8081A, REV 1, 12/96		NJ
C	SHW06.12050	GAMMA-BHC (LINDANE)					8081A, REV 1, 12/96		NJ
C	SHW06.12060	CHLORDANE (TECHNICAL)					8081A, REV 1, 12/96		NJ
C	SHW06.12070	ALPHA-CHLORDANE					8081A, REV 1, 12/96		NJ
C	SHW06.12080	GAMMA-CHLORDANE					8081A, REV 1, 12/96		NJ
C	SHW06.12090	4,4'-DDD					8081A, REV 1, 12/96		NJ
C	SHW06.12100	4,4'-DDE					8081A, REV 1, 12/96		NJ
C	SHW06.12110	4,4'-DDT					8081A, REV 1, 12/96		NJ
C	SHW06.12120	DIELDRIN					8081A, REV 1, 12/96		NJ
C	SHW06.12130	ENDOSULFAN I					8081A, REV 1, 12/96		NJ
C	SHW06.12140	ENDOSULFAN II					8081A, REV 1, 12/96		NJ
C	SHW06.12150	ENDOSULFAN SULFATE					8081A, REV 1, 12/96		NJ
C	SHW06.12160	ENDRIN					8081A, REV 1, 12/96		NJ
C	SHW06.12170	ENDRIN ALDEHYDE					8081A, REV 1, 12/96		NJ
C	SHW06.12180	ENDRIN KETONE					8081A, REV 1, 12/96		NJ
C	SHW06.12190	HEPTACHLOR					8081A, REV 1, 12/96		NJ
C	SHW06.12200	HEPTACHLOR EPOXIDE					8081A, REV 1, 12/96		NJ

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C	SHW06.12210	METHOXYCHLOR					8081A, REV 1, 12/96		NJ
C	SHW06.12220	TOXAPHENE					8081A, REV 1, 12/96		NJ
C	SHW06.13110	PCB-1016					8082, REV 0, 12/96		NJ
C	SHW06.13120	PCB-1221					8082, REV 0, 12/96		NJ
C	SHW06.13130	PCB-1232					8082, REV 0, 12/96		NJ
C	SHW06.13140	PCB-1242					8082, REV 0, 12/96		NJ
C	SHW06.13150	PCB-1248					8082, REV 0, 12/96		NJ
C	SHW06.13160	PCB-1254					8082, REV 0, 12/96		NJ
C	SHW06.13170	PCB-1260					8082, REV 0, 12/96		NJ
A	SHW06.16010	ACENAPHTHENE					8100, REV 0, 9/86		NJ
A	SHW06.16020	ACENAPHTHYLENE					8100, REV 0, 9/86		NJ
A	SHW06.16030	ANTHRACENE					8100, REV 0, 9/86		NJ
A	SHW06.16040	BENZO(A)ANTHRACENE					8100, REV 0, 9/86		NJ
A	SHW06.16050	BENZO(A)PYRENE					8100, REV 0, 9/86		NJ
A	SHW06.16060	BENZO(B)FLUORANTHENE					8100,REV 0, 9/86		NJ
A	SHW06.16070	BENZO(K)FLUORANTHENE					8100, REV 0, 9/86		NJ
A	SHW06.16080	BENZO(GHI)PERYLENE					8100, REV 0, 9/86		NJ
A	SHW06.16090	CHRYSENE					8100, REV 0, 9/86		NJ
A	SHW06.16100	DIBENZO(A,H)ANTHRACENE					8100, REV 0, 9/86		NJ
A	SHW06.16110	FLUORANTHENE					8100, REV 0, 9/86		NJ
A	SHW06.16120	FLUORENE					8100, REV 0, 9/86		NJ
A	SHW06.16130	INDENO(1,2,3-CD)PYRENE					8100, REV 0, 9/86		NJ
A	SHW06.16140	NAPHTHALENE					8100, REV 0, 9/86		NJ
A	SHW06.16150	PHENANTHRENE					8100, REV 0, 9/86		NJ

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A	SHW06.16160	PYRENE					8100, REV 0, 9/86		NJ
C	SHW06.23010	DALAPON					8151A, REV 1, 9/96		NJ
C	SHW06.23020	DICAMBA					8151A, REV 1, 9/96		NJ
C	SHW06.23030	DINOSEB					8151A, REV 1, 9/96		NJ
C	SHW06.23040	2,4-D					8151A, REV 1, 9/96		NJ
C	SHW06.23050	2,4,5-T					8151A, REV 1, 9/96		NJ
C	SHW06.23060	2,4,5-TP					8151A, REV 1, 9/96		NJ
A	SHW06.25010	ACETALDEHYDE					8315A, REV 1, 12/96		NJ
A	SHW06.25020	BUTYLALDEHYDE					8315A, REV 1, 12/96		NJ
A	SHW06.25030	FORMALDEHYDE					8315A, REV 1, 12/96		NJ
A	SHW06.25040	M-TOLUALDEHYDE					8315A, REV 1, 12/96		NJ
C	SHW07.04010	BENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04020	CHLOROBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04030	1,2-DICHLOROBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04040	1,3-DICHLOROBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04050	1,4-DICHLOROBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04060	ETHYLBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.04070	TOLUENE					8260B, REV 2, 12/96		NJ
C	SHW07.04080	TOTAL XYLENES					8260B, REV 2, 12/96		NJ
C	SHW07.04090	BROMODICHLOROMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04100	BROMOFORM					8260B, REV 2, 12/96		NJ
C	SHW07.04110	BROMOMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04120	CARBON TETRACHLORIDE					8260B, REV 2, 12/96		NJ
C	SHW07.04130	CHLOROETHANE					8260B, REV 2, 12/96		NJ

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C	SHW07.04140	2-CHLOROETHYL VINYL ETHER					8260B, REV 2, 12/96		NJ
C	SHW07.04150	CHLOROFORM					8260B, REV 2, 12/96		NJ
C	SHW07.04160	CHLOROMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04170	TRANS, 1,3-DICHLOROPROPENE					8260B, REV 2, 12/96		NJ
C	SHW07.04180	DIBROMOCHLOROMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04190	DICHLORODIFLUOROMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04200	1,1-DICHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04210	1,2-DICHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04220	1,1-DICHLOROETHENE					8260B, REV 2, 12/96		NJ
C	SHW07.04230	TRANS 1,2-DICHLOROETHENE					8260B, REV 2, 12/96		NJ
C	SHW07.04240	1,2-DICHLOROPROPANE					8260B, REV 2, 12/96		NJ
C	SHW07.04250	CIS 1,3-DICHLOROPROPENE					8260B, REV 2, 12/96		NJ
C	SHW07.04260	METHYLENE CHLORIDE					8260B, REV 2, 12/96		NJ
C	SHW07.04270	1,1,2,2-TETRACHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04280	TETRACHLOROETHENE					8260B, REV 2, 12/96		NJ
C	SHW07.04290	1,1,1-TRICHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04300	1,1,2-TRICHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04310	TRICHLOROETHENE					8260B, REV 2, 12/96		NJ
C	SHW07.04320	TRICHLOROFLUOROMETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04330	VINYL CHLORIDE					8260B, REV 2, 12/96		NJ
C	SHW07.04340	ACETONE					8260B, REV 2, 12/96		NJ
C	SHW07.04350	CARBON DISULFIDE					8260B, REV 2, 12/96		NJ
C	SHW07.04360	2-BUTANONE					8260B, REV 2, 12/96		NJ
C	SHW07.04370	2-HEXANONE					8260B, REV 2, 12/96		NJ

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C	SHW07.04380	4-METHYL-2-PENTANONE					8260B, REV 2, 12/96		NJ
C	SHW07.04390	METHYL-TERT-BUTYL ETHER					8260B, REV 2, 12/96		NJ
C	SHW07.04400	ACROLEIN					8260B, REV 2, 12/96		NJ
C	SHW07.04410	ACRYLONITRILE					8260B, REV 2, 12/96		NJ
C	SHW07.04500	HEXACHLOROBUTADIENE					8260B, REV 2, 12/96		NJ
C	SHW07.04540	NAPTHALENE					8260B, REV 2, 12/96		NJ
C	SHW07.04550	STYRENE					8260B, REV 2, 12/96		NJ
C	SHW07.04560	1,1,1,2-TETRACHLOROETHANE					8260B, REV 2, 12/96		NJ
C	SHW07.04570	1,2,4-TRICHLOROBENZENE					8260B, REV 2, 12/96		NJ
C	SHW07.05000	SEMIVOLATILE ORGANICS					8270C, REV 3, 12/96		NJ
C	SHW07.05010	N-NITROSODIPHENYLAMINE					8270C, REV 3, 12/96		NJ
C	SHW07.05020	DIPHENYLAMINE					8270C, REV 3, 12/96		NJ
C	SHW07.05030	CARBAZOLE					8270C, REV 3, 12/96		NJ
C	SHW07.05040	3,3'-DICHLOROBENZIDINE					8270C, REV 3, 12/96		NJ
C	SHW07.05050	4-CHLORANILINE					8270C, REV 3, 12/96		NJ
C	SHW07.05060	2-NITROANILINE					8270C, REV 3, 12/96		NJ
C	SHW07.05062	3-NITROANILINE					8270C, REV 3, 12/96		NJ
C	SHW07.05063	4-NITROANILINE					8270C, REV 3, 12/96		NJ
C	SHW07.05070	2-CHLORONAPHTHALENE					8270C, REV 3, 12/96		NJ
C	SHW07.05080	HEXACHLOROBENZENE					8270C, REV 3, 12/96		NJ
C	SHW07.05090	HEXACHLOROBUTADIENE					8270C, REV 3, 12/96		NJ
C	SHW07.05100	HEXACHLOROCYCLOPENTADIENE					8270C, REV 3, 12/96		NJ
C	SHW07.05110	HEXACHLOROETHANE					8270C, REV 3, 12/96		NJ
C	SHW07.05120	1,2,4-TRICHLOROBENZENE					8270C, REV 3, 12/96		NJ

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C	SHW07.05130	BIS (2-CHLOROETHOXY) METHANE					8270C, REV 3, 12/96		NJ
C	SHW07.05132	BIS (2-CHLOROETHYL) ETHER					8270C, REV 3, 12/96		NJ
C	SHW07.05140	BIS (2-CHLOROISOPROPYL) ETHER					8270C, REV 3, 12/96		NJ
C	SHW07.05150	4-CHLOROPHENYL-PHENYLETHER					8270C, REV 3, 12/96		NJ
C	SHW07.05160	4-BROMOPHENYL-PHENYLETHER					8270C, REV 3, 12/96		NJ
C	SHW07.05170	2,4-DINITROTOLUENE					8270C, REV 3, 12/96		NJ
C	SHW07.05180	2,6-DINITROTOLUENE					8270C, REV 3, 12/96		NJ
C	SHW07.05190	ISOPHORONE					8270C, REV 3, 12/96		NJ
C	SHW07.05200	NITROBENZENE					8270C, REV 3, 12/96		NJ
C	SHW07.05210	BUTYL BENZYL PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05220	BIS (2-ETHYLHEXYL) PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05230	DIETHYL PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05240	DIMETHYL PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05250	DI-N-BUTYL PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05260	DI-N-OCTYL PHTHALATE					8270C, REV 3, 12/96		NJ
C	SHW07.05270	ACENAPHTHENE					8270C, REV 3, 12/96		NJ
C	SHW07.05280	ANTHRACENE					8270C, REV 3, 12/96		NJ
C	SHW07.05290	ACENAPHTHYLENE					8270C, REV 3, 12/96		NJ
C	SHW07.05300	BENZO(A)ANTHRACENE					8270C, REV 3, 12/96		NJ
C	SHW07.05310	BENZO(A)PYRENE					8270C, REV 3, 12/96		NJ
C	SHW07.05320	BENZO(B)FLUORANTHENE					8270C, REV 3, 12/96		NJ
C	SHW07.05330	BENZO(GHI)PERYLENE					8270C, REV 3, 12/96		NJ
C	SHW07.05340	BENZO(K)FLUORANTHENE					8270C, REV 3, 12/96		NJ
C	SHW07.05350	CHRYSENE					8270C, REV 3, 12/96		NJ

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C	SHW07.05360	DIBENZO(A,H)ANTHRACENE					8270C, REV 3, 12/96		NJ
C	SHW07.05370	FLUORANTHENE					8270C, REV 3, 12/96		NJ
C	SHW07.05380	FLUORENE					8270C, REV 3, 12/96		NJ
C	SHW07.05390	INDENO(1,2,3-CD)PYRENE					8270C, REV 3, 12/96		NJ
C	SHW07.05400	2-METHYLNAPHTHALENE					8270C, REV 3, 12/96		NJ
C	SHW07.05410	NAPHTHALENE					8270C, REV 3, 12/96		NJ
C	SHW07.05420	PHENANTHRENE					8270C, REV 3, 12/96		NJ
C	SHW07.05430	PYRENE					8270C, REV 3, 12/96		NJ
C	SHW07.05440	4-CHLORO-3-METHYL-PHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05450	2-CHLOROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05460	2,4-DICHLOROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05470	2,4-DIMETHYLPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05480	2,4-DINITROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05490	2-METHYL-4,6-DINITROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05500	2-METHYLPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05510	4-METHYLPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05520	2-NITROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05530	4-NITROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05540	PENTACHLOROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05550	PHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05560	2,4,5-TRICHLOROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05570	2,4,6-TRICHLOROPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05590	3-METHYLPHENOL					8270C, REV 3, 12/96		NJ
C	SHW07.05600	DIBENZOFURAN					8270C, REV 3, 12/96		NJ

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C	SHW07.05700	1,4-DICHLOROBENZENE					8270C, REV 3, 12/96		NJ
C	SHW07.05750	PYRIDINE					8270C, REV 3 12/96		NJ
A	SHW09.01000	TOTAL REC. PETROL. HYDROCARBONS					8440, REV 0, 12/96		NJ
C	SHW09.02000	CYANIDE TOTAL					9010B, REV 2, 12/96		NJ
C	SHW09.03000	CYANIDE TOTAL, AMENABLE TO CI2					9010B, REV 2, 12/96		NJ
C	SHW09.04100	CYANIDE TOTAL					9014, REV 0, 12/96		NJ
C	SHW09.05000	CYANIDE TOTAL, AMENABLE TO CI2					9012A, REV 1, 12/96		NJ
C	SHW09.06000	TOTAL ORGANIC HALIDES (TOX)					9020B, REV 2, 9/94		NJ
A	SHW09.08100	EXTRACTABLE ORGANIC HALIDES(EOX)					9023, REV 0, 12/96		NJ
A	SHW09.09000	SULFIDES, ACID SOL. & INSOLUBLES							NJ
C	SHW09.10100	SULFIDES, ACID SOL. & INSOL.					9034, REV 0, 12/96		NJ
C	SHW09.13000	SULFATE					9038, REV 0, 9/86		NJ
C	SHW09.14000	pH, HYDROGEN ION, WASTE, >20% WATER					9040B, REV 2, 1/95		NJ
C	SHW09.16000	pH, SOIL AND WASTE					9045C, REV 3, 1/95		NJ
A	SHW09.17000	SPECIFIC CONDUCTANCE					9050A, REV 1, 12/96		NJ
A	SHW09.19000	TOTAL ORGANIC CARBON (TOC)					9060, REV 0, 9/86		NJ
C	SHW09.21000	PHENOLS					9065, REV 0, 9/86		NJ
C	SHW09.22000	PHENOLS					9066, REV 0, 9/86		NJ
C	SHW09.24100	OIL & GREASE-HEM					1664A	1664A, REV 1, 2/99	NJ
A	SHW09.24150	OIL & GREASE TOTAL HEM-NPM					1664A, REV 1, 2/99		NJ
C	SHW09.25000	OIL & GREASE, SLUDGE-HEM					9071B, REV 2, 5/99		NJ

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C	SHW09.25100	OIL & GREASE, SLUDGE-HEM-NPM					9071 B, REV 2, 5/99		NJ
A	SHW09.28100	POLYCHLORINATED BIPHENYLS					9078, REV 0, 12/96		NJ
A	SHW09.28200	POLYCHORINATED BIPHENYLS					9079, REV 0, 12/96		NJ
C	SHW09.29000	FREE LIQUID					9095, REV 0, 9/86		NJ
D	SHW09.31000	CHLORIDE							NJ
C	SHW09.32000	CHLORIDE					9251, REV 0, 9/86		NJ
C	SHW09.40000	CATION-EXCHANGE CAPACITY					9081, REV 0, 9/86		NJ
A	WPP01.01000	FECAL COLIFORM, NUMBER PER 100ml			9221 C & E				NJ
A	WPP01.02000	FECAL COLIFORM, NUMBER PER 100ml			9222 D				NJ
A	WPP01.03000	TOTAL COLIFORM, NUMBER PER 100ml			9221 B				NJ
A	WPP01.04000	TOTAL COLIFORM, NUMBER PER 100ml			9222 B				NJ
A	WPP01.05000	FECAL STREPTOCOCCI,NUMBER PER 100ml			9230 B				NJ
A	WPP01.06000	FECAL STREPTOCOCCI,NUMBER PER 100ml			9230 C				NJ
D	WPP01.07000	FECAL STREPTOCOCCI,NUMBER PER 100ml							NJ
A	WPP01.08000	ENTEROCOCCI			9230 B				NJ
A	WPP01.09000	ENTEROCOCCI			9230 C				NJ
A	WPP01.10000	HETEROTROPHIC PLATE COUNT			9215 B				NJ
D	WPP01.10100	HETEROTROPHIC PLATE COUNT							NJ

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D	WPP01.10200	HETEROTROPHIC PLATE COUNT							NJ
A	WPP01.11000	PSEUDOMONAS AERUGINOSA			9213 F				NJ
D	WPP01.12000	PSEUDOMONAS AERUGINOSA							NJ
A	WPP01.16000	ESCHERICHIA COLI			9213 D				NJ
D	WPP01.16100	ESCHERICHIA COLI							NJ
C	WPP02.01000	ACIDITY as CaCO3	305.1						NJ
C	WPP02.01500	ALKALINITY as CaCO3			2320 B				NJ
A	WPP02.02500	AMMONIA	350.2						NJ
C	WPP02.03000	AMMONIA	350.2						NJ
C	WPP02.04000	AMMONIA	350.2 + .1						NJ
C	WPP02.05000	BIOCHEMICAL OXYGEN DEMAND	405.1						NJ
A	WPP02.06000	BORON	200.7						NJ
C	WPP02.07000	BROMIDE	320.1						NJ
D	WPP02.07500	CALCIUM							NJ
C	WPP02.08000	CALCIUM	200.7						NJ
C	WPP02.09500	CARBONACEOUS BOD (cBOD)			5210 B				NJ
C	WPP02.10500	CHEMICAL OXYGEN DEMAND						HACH 8000	NJ
C	WPP02.11500	CHLORIDE	325.3						NJ
C	WPP02.12500	CHLORIDE	325.1 OR .2						NJ
C	WPP02.13500	COLOR			2120 B				NJ
C	WPP02.15000	CYANIDE	335.2						NJ
D	WPP02.15500	CYANIDE							NJ

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C	WPP02.16000	CYANIDE AMENABLE TO Cl2	335.1						NJ
C	WPP02.16500	FLUORIDE			4500-F B&C				NJ
C	WPP02.19000	HARDNESS-TOTAL as CaCO3			2340 B OR C				NJ
A	WPP02.20100	HARDNESS-TOTAL as CaCO3	200.7						NJ
C	WPP02.22500	KJELDAHL NITROGEN - TOTAL	351.2						NJ
D	WPP02.23500	MAGNESIUM							NJ
C	WPP02.24000	MAGNESIUM	200.7						NJ
D	WPP02.26500	NITRATE-NITRITE							NJ
C	WPP02.27000	NITRATE-NITRITE			4500-NO3 F				NJ
C	WPP02.28000	NITRITE	354.1						NJ
C	WPP02.28500	NITRITE						USGS I-4540-085	NJ
C	WPP02.29000	OIL & GREASE--TOTAL RECOV	413.1						NJ
C	WPP02.29100	OIL & GREASE-HEM-LL	1664A						NJ
A	WPP02.29200	OIL&GREASE-SGT-NON POLAR	1664A						NJ
D	WPP02.29250	OIL & GREASE-NON POLAR							NJ
C	WPP02.30000	TOTAL ORGANIC CARBON (TOC)	415.1						NJ
C	WPP02.30500	ORGANIC NITROGEN	351.1,.2, .3,.4 - 350.1 .2 .3						NJ
C	WPP02.31500	ORTHOPHOSPHATE	365.2						NJ
C	WPP02.32500	PHENOLS	420.1						NJ
C	WPP02.33000	PHENOLS	420.1 + .2						NJ

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C	WPP02.34000	PHOSPHORUS(TOTAL)	365.2 + .3						NJ
D	WPP02.36000	POTASSIUM							NJ
C	WPP02.36500	POTASSIUM	200.7						NJ
C	WPP02.38000	RESIDUE-TOTAL	160.3						NJ
C	WPP02.38500	RESIDUE-FILTERABLE(TDS)			2540 C				NJ
C	WPP02.39000	RESIDUE-NONFILTERABLE(TSS)	160.2						NJ
C	WPP02.39500	RESIDUE-SETTLEABLE			2540 F				NJ
C	WPP02.40000	RESIDUE-VOLATILE	160.4						NJ
A	WPP02.40100	TOTAL, FIXED, & VOLATILE SOLIDS			2540 G				NJ
A	WPP02.44000	SODIUM	200.7						NJ
C	WPP02.45500	SPECIFIC CONDUCTANCE	120.1		2510 B				NJ
C	WPP02.46500	SULFATE	375.4						NJ
C	WPP02.47500	SULFIDE-S	376.1						NJ
A	WPP02.48500	SURFACTANTS			5540 C				NJ
C	WPP02.50000	TURBIDITY	180.1		2130 B				NJ
C	WPP03.05000	CHLORINE			4500-Cl G				NJ
C	WPP03.07000	OXYGEN DISSOLVED			4500-O C				NJ
C	WPP03.08000	OXYGEN DISSOLVED	360.1						NJ
C	WPP03.09000	pH HYDROGEN ION	150.1						NJ
A	WPP03.12000	SULFITE-SO3	377.1		4500-SO3 B				NJ
C	WPP03.14000	TEMPERATURE	170.1		2550 B				NJ
A	WPP04.00800	SAMPLE PREPARATION	200.2 REV 2.8						NJ

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			5/94						
A	WPP04.02000	ALUMINUM	200.7						NJ
C	WPP04.02100	ALUMINUM	200.8						NJ
C	WPP04.04500	ANTIMONY	200.7						NJ
C	WPP04.04600	ANTIMONY	200.8						NJ
D	WPP04.05500	ARSENIC							NJ
C	WPP04.05600	ARSENIC	200.7						NJ
C	WPP04.05700	ARSENIC	200.8						NJ
C	WPP04.08000	BARIUM	200.7						NJ
C	WPP04.08200	BARIUM	200.8						NJ
C	WPP04.11000	BERYLLIUM	200.7						NJ
C	WPP04.11100	BERYLLIUM	200.8						NJ
C	WPP04.13500	CADMIUM	200.7						NJ
C	WPP04.13600	CADMIUM	200.8						NJ
C	WPP04.15000	CHROMIUM (VI)			3500-Cr D				NJ
C	WPP04.18000	CHROMIUM	200.7						NJ
C	WPP04.18100	CHROMIUM	200.8						NJ
A	WPP04.19500	COBALT	200.7						NJ
C	WPP04.19600	COBALT	200.8						NJ
C	WPP04.21500	COPPER	200.7						NJ
C	WPP04.21600	COPPER	200.8						NJ
C	WPP04.26500	IRON	200.7						NJ
C	WPP04.28000	LEAD	200.7						NJ
C	WPP04.28100	LEAD	200.8						NJ

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D	WPP04.30000	MANGANESE							NJ
A	WPP04.31000	MANGANESE	200.7						NJ
C	WPP04.31100	MANGANESE	200.8						NJ
C	WPP04.33000	MERCURY	245.1						NJ
D	WPP04.33500	MERCURY							NJ
A	WPP04.35000	MOLYBDENUM	200.7						NJ
C	WPP04.35200	MOLYBDENUM	200.8						NJ
C	WPP04.37500	NICKEL	200.7						NJ
C	WPP04.37600	NICKEL	200.8						NJ
C	WPP04.45500	SELENIUM	200.7						NJ
C	WPP04.45600	SELENIUM	200.8						NJ
D	WPP04.46000	SELENIUM							NJ
C	WPP04.48000	SILVER	200.7						NJ
C	WPP04.48200	SILVER	200.8						NJ
C	WPP04.50000	THALLIUM	200.7						NJ
C	WPP04.50100	THALLIUM	200.8						NJ
C	WPP04.51100	TIN	200.7						NJ
A	WPP04.51200	TIN	200.8						NJ
C	WPP04.52070	TITANIUM	200.8						NJ
A	WPP04.54000	VANADIUM			3120 B				NJ
C	WPP04.54100	VANADIUM	200.8						NJ
C	WPP04.56500	ZINC	200.7						NJ
C	WPP04.56600	ZINC	200.8						NJ
C	WPP05.09010	ALDRIN	608						NJ

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C	WPP05.09020	ALPHA-BHC	608						NJ
C	WPP05.09030	BETA-BHC	608						NJ
C	WPP05.09040	DELTA-BHC	608						NJ
C	WPP05.09050	GAMMA-BHC	608						NJ
C	WPP05.09060	CHLORDANE	608						NJ
C	WPP05.09070	4,4'-DDD	608						NJ
C	WPP05.09080	4,4'-DDE	608						NJ
C	WPP05.09090	4,4'-DDT	608						NJ
C	WPP05.09100	DIELDRIN	608						NJ
C	WPP05.09110	ENDOSULFAN I	608						NJ
C	WPP05.09120	ENDOSULFAN II	608						NJ
C	WPP05.09130	ENDOSULFAN SULFATE	608						NJ
C	WPP05.09140	ENDRIN	608						NJ
C	WPP05.09150	ENDRIN ALDEHYDE	608						NJ
C	WPP05.09160	ENDRIN KETONE	608						NJ
C	WPP05.09170	HEPTACHLOR	608						NJ
C	WPP05.09180	HEPTACHLOR EPOXIDE	608						NJ
C	WPP05.09190	METHOXYCHLOR	608						NJ
C	WPP05.09200	TOXAPHENE	608						NJ
C	WPP05.11010	PCB-1016	608						NJ
C	WPP05.11020	PCB-1221	608						NJ
C	WPP05.11030	PCB-1232	608						NJ
C	WPP05.11040	PCB-1242	608						NJ
C	WPP05.11050	PCB-1248	608						NJ

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C	WPP05.11060	PCB-1254	608						NJ
C	WPP05.11070	PCB-1260	608						NJ
A	WPP05.14010	AACENAPHTHENE	610						NJ
A	WPP05.14020	ACENAPHTHYLENE	610						NJ
A	WPP05.14030	ANTHRACENE	610						NJ
A	WPP05.14040	BENZO(A)ANTHRACENE	610						NJ
A	WPP05.14050	BENZO(A)PYRENE	610						NJ
A	WPP05.14060	BENZO(B)FLUORANTHENE	610						NJ
A	WPP05.14070	BENZO(GHI)PERYLENE	610						NJ
A	WPP05.14080	BENZO(K)FLUORANTHENE	610						NJ
A	WPP05.14090	CHRYSENE	610						NJ
A	WPP05.14100	DIBENZO(A,H)ANTHRACENE	610						NJ
A	WPP05.14110	FLUORANTHENE	610						NJ
A	WPP05.14120	FLUORENE	610						NJ
A	WPP05.14130	INDENO(1,2,3-CD)PYRENE	610						NJ
A	WPP05.14140	NAPHTHALENE	610						NJ
A	WPP05.14150	PHENANTHRENE	610						NJ
A	WPP05.14160	PYRENE	610						NJ
A	WPP05.20010	FORMALDEHYDE	1667A						NJ
A	WPP05.20020	FURFURAL	1667A						NJ
A	WPP05.20030	ISOBUTYRALDEHYDE	1667A						NJ
A	WPP05.21010	ACETONITRILE	1671A						NJ
A	WPP05.21020	DIETHYLAMINE	1671A						NJ
A	WPP05.21030	DIMETHYL SULFOXIDE	1671A						NJ

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A	WPP05.21040	ETHANOL	1671A						NJ
A	WPP05.21050	METHANOL	1671A						NJ
A	WPP05.21060	2-METHOXYETHANOL(METHYL CELLOSOLVE)	1671A						NJ
A	WPP05.21070	N-PROPANOL	1671A						NJ
A	WPP05.21080	TRIETHYLAMINE	1671A						NJ
A	WPP06.02001	N-AMYL ACETATE	624						NJ
A	WPP06.02002	N-AMYL ALCOHOL	624						NJ
C	WPP06.02010	BENZENE	624						NJ
C	WPP06.02020	BROMODICHLOROMETHANE	624						NJ
C	WPP06.02030	BROMOFORM	624						NJ
C	WPP06.02040	BROMOMETHANE	624						NJ
C	WPP06.02050	CARBON TETRACHLORIDE	624						NJ
C	WPP06.02060	CHLOROBENZENE	624						NJ
C	WPP06.02070	CHLOROETHANE	624						NJ
C	WPP06.02080	2-CHLOROETHYL VINYL ETHER	624						NJ
C	WPP06.02090	CHLOROFORM	624						NJ
C	WPP06.02100	CHLOROMETHANE	624						NJ
C	WPP06.02110	DIBROMOCHLOROMETHANE	624						NJ
C	WPP06.02120	1,2-DICHLOROBENZENE	624						NJ
C	WPP06.02130	1,3-DICHLOROBENZENE	624						NJ
C	WPP06.02140	1,4-DICHLOROBENZENE	624						NJ
C	WPP06.02150	1,1-DICHLOROETHANE	624						NJ
C	WPP06.02160	1,2-DICHLOROETHANE	624						NJ

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C	WPP06.02170	1,1-DICHLOROETHENE	624						NJ
C	WPP06.02180	TRANS-1,2-DICHLOROETHENE	624						NJ
C	WPP06.02190	1,2-DICHLOROPROPANE	624						NJ
C	WPP06.02200	CIS-1,3-DICHLOROPROPENE	624						NJ
C	WPP06.02210	TRANS-1,3-DICHLOROPROPENE	624						NJ
A	WPP06.02212	ETHYL ACETATE	624						NJ
C	WPP06.02220	ETHYLBENZENE	624						NJ
A	WPP06.02222	N-HEPTANE	624						NJ
A	WPP06.02223	N-HEXANE	624						NJ
A	WPP06.02224	ISOBUTYLALDEHYDE	624						NJ
A	WPP06.02225	ISOPROPANOL	624						NJ
A	WPP06.02226	ISOPROPYL ACETATE							NJ
A	WPP06.02227	ISOPROPYLETHER	624						NJ
C	WPP06.02230	METHYLENE CHLORIDE	624						NJ
A	WPP06.02231	METHYL FORMATE	624						NJ
A	WPP06.02232	METHYL TERT-BUTYL ETHER							NJ
A	WPP06.02233	METHYLISOBUTYL KETONE	624						NJ
A	WPP06.02234	TERT-BUTYL ALCOHOL	624						NJ
A	WPP06.02235	TETRAHYDROFURAN	624						NJ
A	WPP06.02238	STYRENE	624						NJ
C	WPP06.02240	1,1,2,2-TETRACHLOROETHANE	624						NJ
C	WPP06.02250	TETRACHLOROETHENE	624						NJ
C	WPP06.02260	TOLUENE	624						NJ
C	WPP06.02270	1,1,1-TRICHLOROETHANE	624						NJ

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C	WPP06.02280	1,1,2-TRICHLOROETHANE	624						NJ
C	WPP06.02290	TRICHLOROETHENE	624						NJ
C	WPP06.02300	TRICHLOROFLUOROMETHANE	624						NJ
C	WPP06.02310	VINYL CHLORIDE	624						NJ
A	WPP06.02312	TOTAL XYLENES	624						NJ
C	WPP06.03010	ACENAPHTHENE	625						NJ
C	WPP06.03020	ACENAPHTHYLENE	625						NJ
C	WPP06.03030	ANTHRACENE	625						NJ
C	WPP06.03040	BENZO(A)ANTHRACENE	625						NJ
C	WPP06.03050	BENZO(B)FLUORANTHENE	625						NJ
C	WPP06.03060	BENZO(K)FLUORANTHENE	625						NJ
C	WPP06.03070	BENZO(A)PYRENE	625						NJ
C	WPP06.03080	BENZO(GHI)PERYLENE	625						NJ
C	WPP06.03090	BUTYL BENZYL PHTHALATE	625						NJ
C	WPP06.03100	BIS (2-CHLOROETHYL) ETHER	625						NJ
C	WPP06.03110	BIS (2-CHLOROETHOXY)METHANE	625						NJ
C	WPP06.03120	BIS (2-ETHYLHEXYL) PHTHALATE	625						NJ
C	WPP06.03130	BIS (2-CHLOROISOPROPYL) ETHER	625						NJ
C	WPP06.03140	4-BROMOPHENYL-PHENYL ETHER	625						NJ
C	WPP06.03150	2-CHLORONAPHTHALENE	625						NJ
C	WPP06.03160	4-CHLOROPHENYL-PHENYL ETHER	625						NJ
C	WPP06.03170	CHRYSENE	625						NJ
C	WPP06.03180	DIBENZO(A,H)ANTHRACENE	625						NJ
A	WPP06.03186	DIBENZOFURAN	625						NJ

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C	WPP06.03190	DI-N-BUTYL PHTHALATE	625						NJ
C	WPP06.03200	1,3-DICHLOROBENZENE	625						NJ
C	WPP06.03210	1,2-DICHLOROBENZENE	625						NJ
C	WPP06.03220	1,4-DICHLOROBENZENE	625						NJ
C	WPP06.03230	3,3'-DICHLOROBENZIDINE	625						NJ
C	WPP06.03240	DIETHYL PHTHALATE	625						NJ
C	WPP06.03250	DIMETHYL PHTHALATE	625						NJ
C	WPP06.03260	2,4-DINITROTOLUENE	625						NJ
C	WPP06.03270	2,6-DINITROTOLUENE	625						NJ
C	WPP06.03280	DI-N-OCTYL PHTHALATE	625						NJ
C	WPP06.03290	FLUORANTHENE	625						NJ
C	WPP06.03300	FLUORENE	625						NJ
C	WPP06.03310	HEXACHLOROBENZENE	625						NJ
C	WPP06.03320	HEXACHLOROBUTADIENE	625						NJ
C	WPP06.03330	HEXACHLOROETHANE	625						NJ
C	WPP06.03340	INDENO(1,2,3-CD)PYRENE	625						NJ
C	WPP06.03350	ISOPHORONE	625						NJ
A	WPP06.03358	METHYLNAPTHALENE	625						NJ
C	WPP06.03360	NAPHTHALENE	625						NJ
A	WPP06.03366	4-CHLOROANALINE	625						NJ
A	WPP06.03367	2-NITROANILINE	625						NJ
A	WPP06.03368	3-NITROANILINE	625						NJ
A	WPP06.03369	4-NITROANILINE	625						NJ
C	WPP06.03370	NITROBENZENE	625						NJ

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C	WPP06.03380	N-NITROSODI-N-PROPYLAMINE	625						NJ
C	WPP06.03390	PHENANTHRENE	625						NJ
C	WPP06.03400	PYRENE	625						NJ
C	WPP06.03410	1,2,4-TRICHLOROBENZENE	625						NJ
A	WPP06.03417	2-METHYLPHENOL	625						NJ
A	WPP06.03418	4-METHYLPHENOL	625						NJ
C	WPP06.03420	4-CHLORO-3-METHYLPHENOL	625						NJ
A	WPP06.03430	2-CHLOROPHENOL	625						NJ
C	WPP06.03440	2,4-DICHLOROPHENOL	625						NJ
C	WPP06.03450	2,4-DIMETHYLPHENOL	625						NJ
C	WPP06.03460	2,4-DINITROPHENOL	625						NJ
C	WPP06.03470	2-METHYL-4,6-DINITROPHENOL	625						NJ
C	WPP06.03480	2-NITROPHENOL	625						NJ
C	WPP06.03490	4-NITROPHENOL	625						NJ
C	WPP06.03500	PENTACHLOROPHENOL	625						NJ
C	WPP06.03510	PHENOL	625						NJ
A	WPP06.03518	2,4,5-TRICHLOROPHENOL	625						NJ
C	WPP06.03520	2,4,6-TRICHLOROPHENOL	625						NJ
C	WPP06.03530	BENZOIC ACID	625						NJ
C	WPP06.03540	p-CRESOL	625						NJ
C	WPP06.03550	ACETOPHENONE	625						NJ
A	WPP06.03560	ALPHA-TERPINEOL	625						NJ
C	WPP06.03570	ANILINE	625						NJ
C	WPP06.03580	BENZIDINE	625						NJ

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C	WPP06.03590	CARBAZOLE	625						NJ
A	WPP06.03600	2,3-DICHLOROANILINE	625						NJ
A	WPP06.03610	O-CRESOL	625						NJ
A	WPP06.03620	N-DECANE	625						NJ
A	WPP06.03630	N-DOCOSANE	625						NJ
A	WPP06.03640	N-DODECANE	625						NJ
A	WPP06.03650	N-EICOSANE	625						NJ
C	WPP06.03660	HEXACHLOROCYCLOPENTADIENE	625						NJ
A	WPP06.03670	N-HEXADECANE	625						NJ
C	WPP06.03680	N-NITROSODIMETHYLAMINE	625						NJ
C	WPP06.03690	N-NITROSODIPHENYLAMINE	625						NJ
A	WPP06.03700	N-OCTADECANE	625						NJ
A	WPP06.03710	N-TETRADECANE	625						NJ
C	WPP06.03720	PYRIDINE	625						NJ
A	WPP06.03730	1-METHYLPHENANTHRENE	625						NJ
A	WPP06.07020	N-AMYL ACETATE	1666A						NJ
A	WPP06.07030	N-AMYL ALCOHOL	1666A						NJ
A	WPP06.07040	N-BUTYL ACETATE	1666A						NJ
A	WPP06.07050	TERT-BUTYL ALCOHOL	1666A						NJ
A	WPP06.07060	ETHYL ACETATE	1666A						NJ
A	WPP06.07070	N-HEPTANE	1666A						NJ
A	WPP06.07080	N-HEXANE	1666A						NJ
A	WPP06.07090	ISOBUTYLALDEHYDE	1666A						NJ
A	WPP06.07100	ISOPROPANOL	1666A						NJ

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Status	Code	Parameter	EPA	ASTM	SM18	USGS	SW846	Other	Primary Accrediting Authority
A	WPP06.07110	ISOPROPYL ACETATE	1666A						NJ
A	WPP06.07120	ISOPROPYLETHER	1666A						NJ
A	WPP06.07130	METHYL FORMATE	1666A						NJ
A	WPP06.07140	METHYLISOBUTYL KETONE	1666A						NJ
A	WPP06.07150	TETRAHYDROFURAN	1666A						NJ
A	WPP06.07160	TRICHLOROFLUOROMETHANE	1666A						NJ
A	WPP06.07170	m+p-XYLENE	1666A						NJ
A	WPP06.07180	o-XYLENE	1666A						NJ
C	WPP07.01000	ALDRIN	608						NJ
D	WPP07.02000	ALDRIN							NJ
C	WPP07.09000	alpha-BHC	608						NJ
C	WPP07.11000	beta-BHC	608						NJ
D	WPP07.12000	beta-BHC							NJ
C	WPP07.13000	delta-BHC	608						NJ
C	WPP07.15000	gamma-BHC (LINDANE)	608						NJ
D	WPP07.16000	gamma-BHC (LINDANE)							NJ
C	WPP07.20000	CHLORDANE (TECHNICAL)	608						NJ
D	WPP07.21000	CHLORDANE (TECHNICAL)							NJ
C	WPP07.23000	2,4-D							NJ
C	WPP07.24000	4,4'-DDD	608						NJ
D	WPP07.25000	4,4-DDD							NJ
C	WPP07.26000	4,4'-DDE	608						NJ
D	WPP07.27000	4,4'-DDE							NJ
C	WPP07.28000	4,4'-DDT	608						NJ

304756

National Environmental Laboratory Accreditation Program
Annual Certified Parameter List and Current Status

INTEGRATED ANALYTICAL LABS
273 FRANKLIN ROAD
RANDOLPH, NJ 07869
Lab ID 14751

Effective Date: 07/01/2002 Expiration Date: 06/30/2003

Status	Code	Parameter	EPA	ASTM	SM18	USGS	SW846	Other	Primary Accrediting Authority
D	WPP07.29000	4,4'-DDT							NJ
C	WPP07.37000	DIELDRIN	608						NJ
D	WPP07.38000	DIELDRIN							NJ
C	WPP07.42000	ENDOSULFAN I	608						NJ
C	WPP07.43000	ENDOSULFAN II	608						NJ
C	WPP07.45000	ENDOSULFAN SULFATE	608						NJ
D	WPP07.46000	ENDOSULFAN SULFATE							NJ
C	WPP07.47000	ENDRIN	608						NJ
C	WPP07.49000	ENDRIN ALDEHYDE	608						NJ
D	WPP07.50000	ENDRIN ALDEHYDE							NJ
C	WPP07.54000	HEPTACHLOR	608						NJ
D	WPP07.55000	HEPTACHLOR							NJ
C	WPP07.56000	HEPTACHLOR EPOXIDE	608						NJ
[illegible]	WPP07.57000	HEPTACHLOR EPOXIDE							NJ
A	WPP07.60000	MALATHION			6630 C				NJ
C	WPP07.62000	METHOXYCHLOR			6630 B & C				NJ
A	WPP07.64000	MIREX			6630 B & C				NJ
C	WPP07.83000	2,4,5-T			6640 B				NJ
C	WPP07.84000	2,4,5-TP(SILVEX)			6640 B				NJ
C	WPP07.85000	TOXAPHENE	608						NJ
D	WPP07.86000	TOXAPHENE							NJ

Key: A Applied, C Accredited, D Dropped by Lab, S Suspended, T Temporary Certification

ATTACHMENT 2

ATTACHMENT 2

Laboratory Chain of Custody Procedures

INTEGRATED ANALYTICAL LABORATORIES, LLC

Title: CHAIN of CUSTODY PROCEDURES
Document #: IAL SOP1.0900
Revision #: 03
Date: August 29, 2001

Revision Author: _____
Maria Colatarci

QA Officer: _____
Regina Ramsay

Lab Manager: _____
Michael Leftin

Integrated Analytical Laboratories, LLC. (IAL) Standard Operating Procedure for Chain of Custody Procedures

1.0 External Chain of Custody

1.1 The External Chain of Custody and Glassware Order Forms (with shipping containers) are supplied to the client for each sampling event. Sample and shuttle custody seals will be used in conjunction with the Chain of Custody when requested by the client. The Client Service Representative will initiate the Glassware Order Form for the sample bottles and shipping containers. One Glassware Order Form will be generated for each sampling event. The name and address of the client, laboratory, project manager, job name, person preparing the bottle orders and shipping container will be indicated on each Glassware Order Form.

1.2 Upon arrival of the samples to the laboratory, the Sample Custodian will review and compare the Chain of Custody to the samples received for the following information:

a) Sample number
b) Sampling Location
c) Sampling Date and time
d) Sample matrix
e) Analyses required
f) Number of containers
g) Date and time custody transfer to the laboratory
h) Sample holding times have not been exceeded
i) Proper preservatives have been added
j) Deliverables required

SOP - CHAIN of CUSTODY PROCEDURES cont.

1.3 When the Sample Custodian has reviewed the Chain of Custody and the samples for the above information, he/she will complete a Sample Receipt Verification Form documenting receipt of the samples.

1.3.1 Sample condition will be documented on this form as required by the NJAC 7:18-5.6 of 7/96 (pp. 84-85): *"Before accepting custody of a regulatory sample, the laboratory shall determine that the sample is properly labeled and has met the handling and preservation requirements. If the sample fails to meet those requirements, the laboratory shall indicate that failure on the chain-of-custody section of the sample request form or the chain of custody form."*

1.4 Any nonconformance will be identified on this form.

1.5 Conditions that will be recorded include:

1.5.1 Proper preservation techniques including cooler temperature

1.5.2 Headspace in containers designated for volatile organic analysis

1.5.3 Sufficient sample volume

1.6 The client will be notified immediately regarding any deficiencies and as to the proper course of action, which should be taken. All information is documented on the Sample Receipt Verification Form.

1.7 Any errors that are made on a Chain of Custody regardless of origin are handled in the following manner:

1.7.1 The client is notified immediately upon discovery of the error

1.7.2 All information is documented on the Internal Chain of Custody or the Sample Receipt Verification Form, as well as the date and initials of the person making the correction or revision.

1.7.3 The Internal Chain of Custody is then indicated as revised with the revision number.

1.7.4 A copy of the corrected/revised Internal Chain of Custody is incorporated into the final report.

1.8 The Sample Custodian is the person ultimately responsible for the acceptance of the samples and the integrity of the shipment as well as the integrity of the samples while in the possession of IAL.

SOP - CHAIN of CUSTODY PROCEDURES cont.

2.0 Internal Chain of Custody

2.1 An Internal Chain of Custody is initiated for each project received at the laboratory. The name and title of the person accepting the samples, field seal number, date/time seal broken, case number and sample identification is transferred to each Internal Chain of Custody generated.

2.2 All requests for analysis, and all subsequent changes, modifications, corrections, or revisions are documented on the Internal Chain of Custody form in the laboratory central data system for access by appropriate IAL personnel.

2.3 A copy of the final revised Internal Chain of Custody form is included with the data report package in the final section of the report, after the External Chain of Custody and before the Sample Receipt Verification form. This form consists of, in addition to the information listed in 2.1, a chart detailing the final status of all analyses, whether performed or canceled, and communications with the client during the course of sample custody at IAL, including documentation concerning changes, modifications, corrections or revisions.

2.4 The person initially responsible for the Internal Chain of Custody is the Sample Log-In Officer.

This SOP is current and in effect from August 29, 2001 and until such time as it is superceded by Revision #04.

ATTACHMENT 3

ATTACHMENT 3

Non-CLP Superfund Analytical Services Tracking Form

NON-CLP SUPERFUND ANALYTICAL SERVICES TRACKING FORM

Reference No._____
(Assigned by Region)

Region_____ CERCLIS No._____

Sampling Period_____ To _____

A separate form should be completed for each sample group, which is defined as a group of samples that are associated with a unique site, field team, sampling period, and laboratory (if applicable). The number of samples contained in each sample group is determined by the EPA Site Manager.

1. Site Name, City, State: _____

2. Type of activity (check all that apply):

[ ] RI/FS [ ] Remedial Design [ ] Preliminary Assessment [ ] SSI [ ] LSI
[ ] Removal Site Eval. [ ] Removal Action [ ] Remedial Action [ ] Operation/Maintenance [ ] NPL Delisting
[ ] PRP Oversight [ ] Other, specify [ ] Oil Response [ ] UST Response
_____

3a. Analytical facility/equipment used (check all that apply): { } = Facility Code included for use in question 5b.
[ ] Fixed laboratory {L} [ ] Fieldable equipment {F} [ ] Temporary on-site laboratory {T}
[ ] Mobile laboratory {M} [ ] Portable equipement {P} [ ] Other {O}, specify_____

3b. Laboratory Name (if applicable)_____ City, State _____

Subcontractor Laboratory (if applicable)_____

4a. Funding Lead: [ ] Superfund [ ] Other Federal Agency, specify_____
[ ] PRP [ ] State, specify_____ [ ] Other, specify affiliation_____

4b. Field Contract (Superfund lead only): [ ] TAT [ ] ERCS [ ] FIT [ ] ARCS [ ] TES
[ ] ESAT [ ] Other, specify _____

Contractor Company _____

5a. Total number of samples analyzed_____

5b. Specific Analysis Information (use additional pages if necessary to identify all analyses):

Analysis Type (e.g. VOAs, Metals, PCBs)	Facility Code (see 3a)	Matrix	# Samples	Sample Preparation Source & Method # (if none answer 5c)		Analysis Source & Method # (if none, answer 5c)	

Samples = # Sampling Points + # Field QC Samples

5c. If non-standard methods were used, list below and specify if performance data are available for the matrices, analytes, and detection limits used. (Y = yes, N = No, D = Don't Know)

Non-standard sample preparation/cleanup techniques:	Matrices	Analytes	Detection Limits
_____	_____	_____	
_____	_____	_____	
Non-standard analytical methods:			
_____	_____	_____	_____
_____	_____	_____	_____

NON-CLP SUPERFUND ANALYTICAL SERVICES TRACKING FORM

6. Reasons for selecting non-CLP analytical services for these samples (check all that apply):
[ ] Proximity to site [ ] Direct interaction with lab [ ] Unique parameter analysis [ ] Cost savings
[ ] Product control [ ] Ease of acquiring services [ ] Less paperwork [ ] Method flexibility
[ ] Quick turnaround [ ] Select locations for further analysis
[ ] Other, specify_____

7. Are the environmental data from this sampling event stored electronically and available to EPA personnel?
[ ] No [ ] Don't know [ ] Yes, contained on: [ ] PC [ ] Mainframe (including minicomputers)

8. For laboratory anayses, what was the turnaround time?_____ Days Was it met? [ ] Yes [ ] No [ ] Don't know

9a. Document(s) where sampling, analytical, and QC requirements are defined (check all that apply):
[ ] QAPjP [ ] SAP [ ] FOP/TDD/TID [ ] Other, specify _____

9b. Document(s) approved by: [ ] ESD [ ] WMD [ ] Other, specify affiliation_____

9c. For each analytical facility/equipment used, please indicate whether the QA/QC requirements were defined in the above documents (Def) and whether compliance was adequate to meet the intended purpose (Met).

	Fixed lab		Mobile lab		On-Site lab		Fieldable		Portable		Other	
	Def	Met	Def	Met	Def	Met	Def	Met	Def	Met	Def	Met
Analytical Method(s)												
Sample preservation & handling												
Sample Chain of Custody												
Sample Holding Times							XX	XX	XX	XX		
Detection/Quantification limits												
Equipment maintenance/calibration												
Documentation												
Frequency & type of QC samples												

Y = yes N = no R = data not reviewed for this criterion (only applicable for Met column)

10. Was the laboratory audited as part of the Superfund program by:
[ ] EPA or EPA Contractor [ ] PRP [ ] Not audited [ ] Don't know
Comments:_____

11a. Were data reviewed for technical limitations? [ ] Yes [ ] No (go to 12)

11b. Reviewed by: [ ] ESD/ESAT [ ] User [ ] Other, specify affiliation_____

11c. Extent of review: [ ] Full review of _____% of the data
[ ] Partial review of _____% of the data

11d. Review criteria used: [ ] CLP National Functional Guidelines
[ ] QA/QC Guidance for Removal Activities (ERT Guidance)
[ ] Other, specify_____

12. Were the quality and quantity of data sufficient to meet the intended purpose?
[ ] Yes [ ] No (explain below) [ ] Don't know (explain below)
Reason:_____

Completed by: _____ Date: _____
Name and Affiliation

304766

INSTRUCTIONS FOR COMPLETING THE NON-CLP SUPERFUND ANALYTICAL SERVICES TRACKING SYSTEM FORM (1/91)

These instructions are intended to provide additional explanation and assist individuals in completing the data collection form for the non-Contract Laboratory Program (non-CLP) tracking system, a system for monitoring the use, magnitude and quality of non-CLP services within the Regions. Non-CLP analytical services refer to any Superfund services that are not acquired or generated through CLP Routine Analytical Services or Special Analytical Services (i.e., services not scheduled through the CLP Sample Management Office). For purposes of this tracking system, Superfund activities are those which are funded by Superfund or involve work at a Superfund site. Non-CLP may include services generated by Environmental Services Division (ESD) laboratories, field contractors and their subcontractors, states, other federal facilities, and Potentially Responsible Parties (PRP).

A separate form should be completed for each sample group analyzed using non-CLP analytical services. A sample group is defined as a group of samples that are associated with a unique site, field team, sampling period and laboratory (if applicable). The number of samples contained in each sample group is determined by the EPA site manager. After completion of the form, the information is entered into a Regional database and is also compiled into a national database at EPA Headquarters. In the instructions, the number in parentheses following a data element indicates the length of the corresponding field in the database. The form, along with a complete glossary is attached.

- The Reference No. (10) is used by the Regions for identifying individual tracking forms/records. Please ensure that all record numbers used within the Region (including numbers used by the Region's contractors) are unique.

- Enter the Region in which the Superfund site is located.

- Enter the official CERCLIS No. (12)

- Enter the period during which sampling was conducted. If sampling was completed in one day, enter that date for both the beginning and the end date of sampling.

1. Enter the Site name (40), city (35), and state (2) as they appear on all official documentation.

2. Please indicate the type(s) of activity (25) for which these environmental data will be used. The first three choices generally refer to pre-remedial activities, the next five to remedial, and the following four to removal activities. When PRP oversight is checked, one of the other activities must also be checked to specify the actual site decision that is being made.

3. Please indicate the type(s) of facility or equipment used (30) to perform the analyses. A facility code is defined in brackets after each response. The code is to be used in answering question 5b to specify the type of facility or equipment used to perform each type of analysis.

3b. The laboratory name (35) and the city (35) and state (2) in which the laboratory is located must be entered for all fixed laboratory analyses. This category may or may not be applicable for mobile laboratory and temporary on-site laboratory analyses.

Subcontractor laboratory (35) refers only to those instances when some or all of the analyses are performed by the laboratory under subcontract to the laboratory designated above.

4a. Indicate the organization that has the funding lead (45) and is financially responsible for the analytical service.

4b. Field contracts (10) listed are only applicable for Superfund-lead analyses.

For Contractor company (30), specify the contractor or subcontractor responsible for procuring the analytical services . If more than one company is represented, enter the prime contractor company name.

5a. Specify the total number of samples analyzed (3) using all facilities/equipment specified above. This is calculated by:

#samples - #Sampling Points + #Field QC Samples

For example, soil collected from a particular sampling point will be regarded as one sample, regardless of whether it is analyzed for inorganic, organic, or both types of parameters. This is different from the CLP's definition in which this soil would be counted as two separate samples (organic and inorganic)

5b. For analyses type (40), enter the fraction, compound group, compound, analyte or determination. To avoid confusion and prevent misspelled entries, choose from the following list of common analysis types. (This list is also provided in the database software).

Ammonia	Furans
Aromatics	Halocarbons
Biological Toxicity	Herbicides
Biological Oxygen Demand (BOD)	Inorganics
Chlorinated Hydrocarbons	Metals
Chloride	Methane
Chlorine	Oil & Grease
Carbon Dioxide (CO2)	Organics
Chemical Oxygen Demand (COD)	PAHs
Coliform	PCBs
Cyanide	Pesticides & PCBs
Dioxins and Furans	Pesticides
Dioxins	Petroleum Hydrocarbons

pH	Sulfide
Phthalate Ester	Sulfite
Phenolics	TCLP Extraction
Phenols	Total Organic Carbon (TOC)
SemiVOAs	Total Organic Halides (TOX)
Sulfate	VOAs

If the analyte name is not contained in this list, please enter it. Note that it is important to keep the terminology consistent (e.g., VOAs, not volatiles or volatile organics). Individual metals should be spelled out, not listed by chemical symbol.

The facility code (1) is obtained from the response to question 3a.

Common matrices (10) include the following. Please ensure that consistent terminology is used for other matrices.

Air	Dust	Oil	Tar
Ash	Liquid (non-aqueous)	Sludge	Water
Biota		Soil/Sediment	Wipes

Enter the number of samples (3) analyzed for each analysis type using the equation in 5a.

The source (10) of the sample preparation and analysis methods include, but are not limited to the following. "If none" indicates that the methods are non-standard (see 5c. For an explanation).

- CLP SOW - Contract Laboratory Program Statement of Work
- FASP SOG - Field Analytical Support Project Standard Operating Guidance
- STD Meth - ASTM "Standard Methods for the Examination of Water and Wastewater"
- FSMC - Field Screening Methods Catalog
- Federal Register methods
- MCAWW - "Methods for Chemical Analysis of Water and Wastes"
- SW-846 - "Test Methods for Evaluating Soild Waste Physical/Chemical Methods"

Specify the method number (15) used in this analysis. If CLP methods were used, enter the code description for the SOW used. Choose from the following

MC	Multi-Concentration
LC	Low Concentration
HC	High Concentration
DF	Dioxins/Furans

5c. A non-standard method is one that is not found in a compendium, catalog, or published document. This may include methods that have been modified in-house or obtained from a source that is not easily referenced or recognized. The analysis type, fraction code, matrix,

and # of samples for non-standard methods must also be entered in 5b.

Include a brief description (40) for each non-standard method and indicate whether performance data are available to verify the method's performance with the matrices, analytes, and detection limits used in this analysis.

6. Please check all of the reasons for using non-CLP analytical services (30) for this particular sample group.

7. If an electronic file of the environmental data is available to EPA, indicate how the data are stored.

8. Enter the turnaround time (3) to the nearest half day. Therefore, 36 hrs. Will be 1.5 days, etc.

9a. Please indicate all documents (40) specifying the sampling, analytical, and QC requirements for the sample group.

9b. Indicate the Regional EPA Division or other organization responsible for approving the document(s) (20) specified in 9a.

9c. Enter a "Y" or "N" to indicate whether the requirements were defined in the document(s) indicated above, and whether compliance with the requirements was adequate to meet the intended purpose. If the data review did not address a given criterion, compliance with the requirements for theat criterion can not be determined and an "R" should be entered in the Requirements Met column.

Please note that even though a data review was performed, all included QA/QC criteria may not have been reviewed.

10. Only audits performed under the Superfund program are applicable. Please do not include audits such as those performed for drinking water or state certifications. Please provide any relevant comments (40) concerning the audit(s) in the space provided.

11a. If no technical dat review was performed, skip to question 12.

11b. Please designate whether the data were reviewed by (20) the Regional ESD/ESAT. The user, or other organization.

11c. Specify the percentage of the entire sample group that received a full data review (3), and the percentage that received a partial data review.

11d. Specify the guidance containing the review criteria (50) used to evaluate the analytical data.

12. Please indicate whether the quality and quantity of the data generated in this sampling event were sufficient to support the intended purpose for generating the analytical data.

- Include the name and affiliation of the person who completed the hardcopy form and the date the form was completed.

APPENDIX G

APPENDIX G

Health and Safety Plans

APPENDIX G

SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR DEMOLITION WORK ON THE CELOTEX ROADWAY EASEMENT ON QUANTA RESOURCES SUPERFUND SITE EDGEWATER, NEW JERSEY

Prepared for:

Edgewater Enterprises, LLC
525 River Road
Edgewater, New Jersey

May 16, 2003

M&M CONSULTING & CONTRACTING INC.

SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR DEMOLITION WORK ON THE CELOTEX ROADWAY EASEMENT ON QUANTA RESOURCES SUPERFUND SITE EDGEWATER, NEW JERSEY

1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (HASP) has been developed by M&M Consulting & Contracting, Inc. of Jersey City, New Jersey (M&M), with input from Dan Raviv Associates, Inc. (DRAI), to establish the site-specific health and safety procedures required to minimize any potential risk to personnel involved in the demolition work proposed for the "Roadway Easement" on the Quanta Resources Superfund Site in Edgewater, New Jersey. Refer to Figure 1 for the site location map. This plan applies to all M&M employees as well as all subcontractor personnel involved in this portion of the work proposed on the site. This HASP is included as an appendix to the Remedial Action Workplan (Workplan) being prepared by DRAI.

All activities covered by this HASP must be in compliance with this document.

2.0 EMERGENCY INFORMATION

If a medical emergency should occur, the appropriate emergency telephone numbers are listed below. Directions to the nearest hospital and medical center are detailed below.

Emergency Phone Numbers

Hospital	Palisades Medical Center Edgewater, New Jersey
Ambulance	911
Edgewater Fire Department	911
Edgewater Police Department	911
Hospital (Palisades Medical Center)	(201) 955-7000
Poison Control Center	(800) 962-1253
US Coast Guard/USEPA National Response Center	(800) 424-8802
NJDEP Spill (Hot Line) Emergency Action Line	(888) WARN DEP
NJ State Police	(609) 882-2000

Directions to the Palisades Medical Center (nearest)

Primary source of medical assistance for the Site:

Palisades Medical Center
7600 River Road
Edgewater, New Jersey 07047

- Turn south from site onto River Road, at one of the entrance/exits. Proceed south on River Road for approximately a mile to Palisades Medical Center. Map can be found as Figure 2.

3.0 PROJECT PERSONNEL (CELOTEX AND ROADWAY EASEMENT)

Owner (Site Wide) - Edgewater Enterprises, LLC

Duties: - Will provide technical support as needed during the demolition phase of this project.

Site Superintendent (Site Wide) - March Associates, Inc.

Duties: - Responsible for the overall implementation of construction activities on both the adjacent Celotex Site and the Easement on the Quanta Resources Superfund Site.
- Will not be responsible for the methods in which demolition is conducted, only that it is completed in a timely manner.

Project Manager (demolition only) - M&M Consulting & Contracting, Inc.

Duties: - Responsible for the proper demolition of structures on the Quanta Resources Superfund Site that have been proposed for demolition as set forth in the Demolition and Non- Hazardous Substances Disposal Plan (Appendix C to the Workplan).
- Responsible for Health and Safety of personnel involved in the demolition of structures on the site.

Site Health and Safety Officer (Site Wide) – Environmental Waste Management Associates (EWMA)

Duties: - Responsible for the overall health and safety of all personnel present on the adjacent Celotex property.

4.0 DEMOLITION EQUIPMENT

The demolition work proposed for the Quanta Site will be conducted with the following equipment:

- One Daewoo 220 Excavator equipped with a grapple
- Demo Saws

5.0 SITE BACKGROUND AND SPECIFIC SCOPE OF WORK

The Quanta Site has only recently become listed to the National Priorities List (Superfund) by the United States Environmental Protection Agency (USEPA). The site is currently abandoned and is no longer an active area. Previous uses of the site have all been industrially related.

Currently there are three structures located on the Quanta Site that are in the Celotex Roadway Easement, and therefore must be demolished and removed from the site. M&M Consulting & Contractors, Inc. has been retained by Edgewater Enterprises, LLC. to complete the demolition and disposal of these three structures as well as other scattered non-hazardous debris within the easement. All structures will be demolished down to existing grade and no further. Concrete slabs will be left in place. See Workplan Appendix C for the Demolition and Non-Hazardous Materials Disposal Plan.

6.0 POSSIBLE WORK HAZARDS

All materials encountered by the demolition workers during this phase of work will be non-hazardous. Any hazardous substances will be removed from the Site in accordance with the Hazardous Substances Disposal Plan (Workplan Appendix B). Site contamination exists below ground surface and all structures will be demolished only to existing grade. The most probable hazards encountered by the demolition personnel will be physical, such as sharp objects, heavy machinery, and heavy materials.

7.0 REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE)

Since there will be no excavation of soils or material below existing grade, demolition personnel are not required to be Occupational Safety and Health Association (OSHA) 40 hour trained.

Required PPE: (Standard Construction)

- hard hats, steel toe boots, eye protection, dust mask (optional), gloves (optional)

These must be worn at all times while working on the Quanta Site.

Figure 1: SITE LOCATION MAP

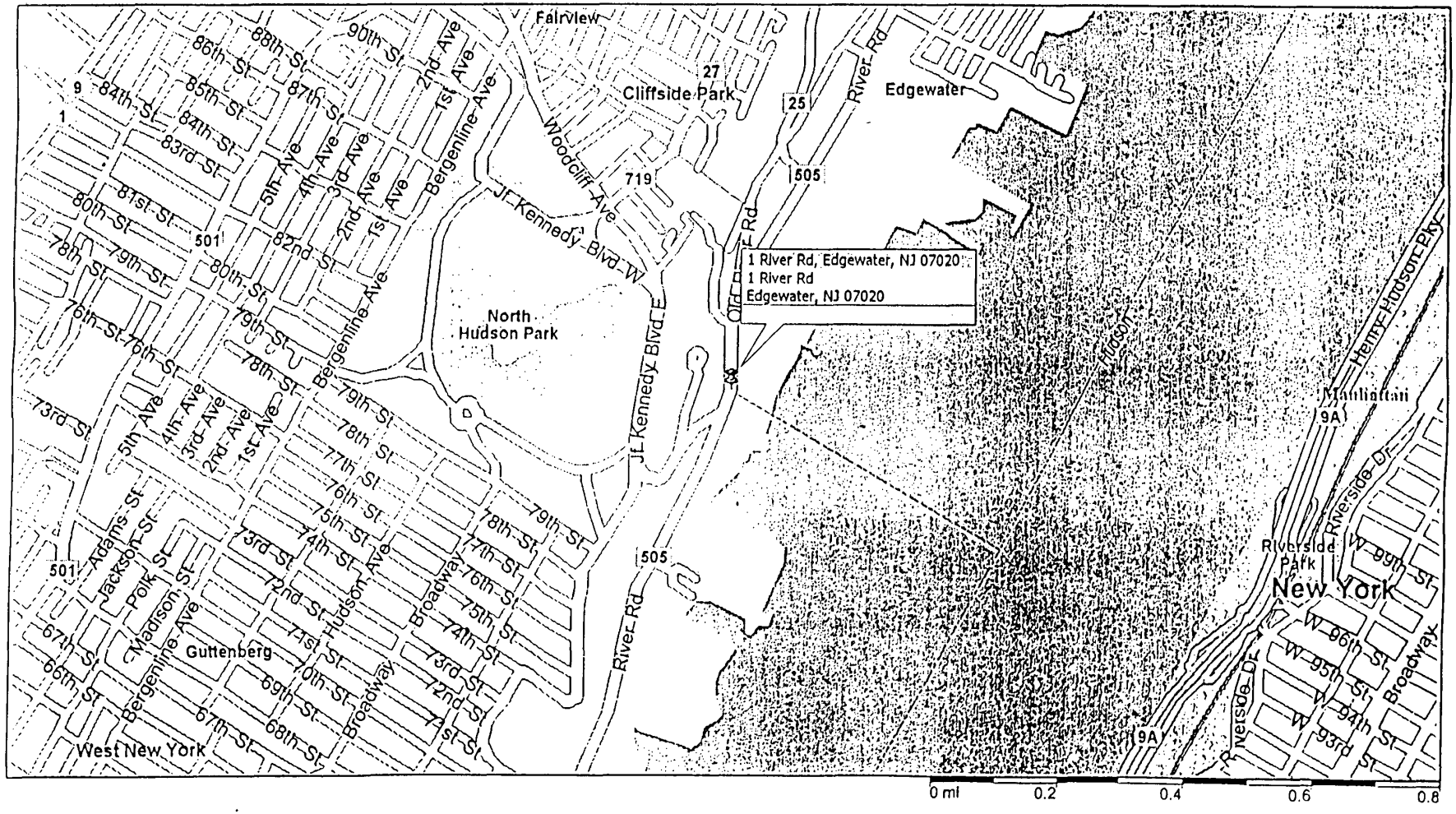

Figure 2: HOSPITAL ROUTE MAP